



January 16, 2009

Mr. Victor Alvarez  
United States Environmental Protection Agency  
Region 1, Suite 1100  
1 Congress Street  
Boston, MA 02114-2023

**RE: Notice of Intent for Remediation General Permit  
Re-Submittal**  
Common Street Trust Building  
102-104 Trapelo Road  
Belmont, Massachusetts  
MADEP RTN 3-23300

Dear Mr. Alvarez,

As per our prior conversations Coler & Colantonio, Inc. is re-submitting this Remediation General Permit (RGP) - Notice of Intent (NOI) associated with the discharge of water from a sump system that is located in the basement of 102-104 Trapelo Road located in Belmont, Massachusetts (the "Site"). The initial RGP was submitted to the United States Environmental Protection Agency (EPA) on May 22, 2006. The purpose of the re-submittal is to provide EPA with the necessary documentation for their record.

The RGP is for the discharge of water from a basement sump system, which has become contaminated with volatile organic compounds, dissolved lead and cyanide, to a municipal storm water catch basin. Basement sump system has been operating at the Site for the past 15 to 20 years or so. In 2006 the sump system was converted to a Pump & Treat (P&T) system in order to mitigate an Imminent Hazard (IH) condition and to implement Immediate Response Actions (IRAs) that have been reported to the Massachusetts Department of Environmental Protection (MADEP) and is being addressed under the Release Tracking Number (RTN) 3-23300. The sump system was modified into the P&T system in 2006 and consists of three previously installed sump pumps that are manifolded together by PVC piping so that the water can be treated by an activated coconut carbon vessel prior to discharging into the storm drain located outside the southwest corner of the Site building.

Coler & Colantonio has been collecting influent and effluent samples to monitor the P&T system for volatile organic compounds (VOCs), dissolved lead, and total cyanide since May 2006 and has been recording the discharged water volumes by an inline water meter. Coler & Colantonio has been reviewing the data and if the data indicated that there is "break-through" in the carbon then the carbon was exchanged. The monitoring and P&T system maintenance

activities have been documented in the Remedial Monitoring Reports and the IRA Status Reports that were prepared in accordance with 310 CMR 40.0000, pursuant to the Massachusetts Contingency Plan (MCP), and have been submitted to the MADEP over the past several years.

Coler & Colantonio, Inc. is the environmental consultant for the Site and will be the contractor that will operate the P&T system on behalf of Jenkins-Starr, LLC., the facility/site owner. The following is the contact information for the owner and operator:

Coler & Colantonio, Inc.  
101 Accord Park Drive  
Norwell, MA. 02061  
Phone: 781/982-5400

Jenkins-Starr, LLC.  
70 Industrial Drive  
Holden, MA. 01520  
Phone: 978/ 263-1086

Contact: Mr. Ronald K. Burns, LSP  
Division Manager,  
Environmental Division

Contact: Mr. Christopher Starr,  
Managing Partner

In accordance with the RGP-NOI, the State Application Form BRPWM 12 and associated payment are **not applicable** to this project because the Site is currently a MADEP MCP Site pursuant to 310 CMR 40.0000.

If you have any questions or need additional information please do not hesitate to contact the undersigned.

Sincerely,  
**COLER & COLANTONIO, INC.**



Glen A. Cote  
Project Manager



Ronald K. Burns, PE, LSP  
Division Manager – Environmental Services

cc: C. Starr  
J. Wang, MADEP

Attachments:

1. Remedial General Permit - Notice of Intent
2. Site Locus
3. Process Flow Diagram
4. Discharge Maps
5. Laboratory Analytical Reports
6. Best Management Practice Plan

## **B. Suggested Form for Notice of Intent (NOI) for the Remediation General Permit**

**1. General site information.** Please provide the following information about the site:

a) Name of <b>facility/site</b> :		Facility/site address:		
Location of <b>facility/site</b> : longitude: _____ latitude: _____	Facility SIC code(s):  5812, 5531	Street:		
b) Name of <b>facility/site owner</b> :		Town:		
Email address of owner:		State:	Zip:	County:
Telephone no. of facility/site <b>owner</b> :				
Fax no. of facility/site <b>owner</b> :	<b>Owner</b> is (check one): 1. Federal _____ 2. State/Tribal _____ 3. Private _____ 4. other, if so, describe:			
Address of <b>owner</b> (if different from site):				
Street:				
Town:	State:	Zip:	County:	
c) Legal name of <b>operator</b> :	<b>Operator</b> telephone no:			
	<b>Operator</b> fax no.:		<b>Operator</b> email:	
<b>Operator</b> contact name and title:				

Address of <b>operator</b> (if different from owner):		Street:	
Town:	State:	Zip:	County:
d) Check “yes” or “no” for the following: 1. Has a prior NPDES permit exclusion been granted for the discharge? Yes___ No___, if “yes,” number: 2. Has a prior NPDES application (Form 1 & 2C) ever been filed for the discharge? Yes___ No___, if “yes,” date and tracking #: 3. Is the discharge a “new discharge” as defined by 40 CFR 122.2? Yes___ No___ 4. For sites in Massachusetts, is the discharge covered under the MA Contingency Plan (MCP) and exempt from state permitting? Yes___ No___			
e) Is site/facility subject to any State permitting or other action which is causing the generation of discharge? Yes___ No___ If “yes,” please list: 1. site identification # assigned by the state of NH or MA: 2. permit or license # assigned: 3. state agency contact information: name, location, and telephone number:		f) Is the site/facility covered by any other EPA permit, including: 1. multi-sector storm water general permit? Y___ N___, if Y, number: 2. phase I or II construction storm water general permit? Y___ N___, if Y, number: 3. individual NPDES permit? Y___ N___, if Y, number: 4. any other water quality related permit? Y___ N___, if Y, number:	

**2. Discharge information.** Please provide information about the discharge, (attaching additional sheets as needed) including:

a) Describe the discharge activities for which the owner/applicant is seeking coverage:		
b) Provide the following information about each discharge:	1) Number of discharge points:	2) What is the <b>maximum</b> and <b>average flow rate</b> of discharge (in cubic feet per second, ft <sup>3</sup> /s)? Max. flow_____ Average flow_____. Is maximum flow a <b>design value</b> ? Y___ N___ For average flow, include the units and appropriate notation if this value is a design value or estimate if not available.
3) Latitude and longitude of each discharge within 100 feet: pt.1:long.____ lat.____; pt.2: long.____ lat.____; pt.3: long.____ lat.____; pt.4:long.____ lat.____; pt.5: long.____ lat.____; pt.6:long.____ lat.____; pt.7: long.____ lat.____; pt.8:long.____ lat.____; etc.		

4) If hydrostatic testing, total volume of the discharge (gals):	5) Is the discharge intermittent_____ or seasonal_____? Is discharge ongoing      Yes _____ No _____?
c) Expected dates of discharge (mm/dd/yy): start_____ end_____	
d) Please attach a line drawing or flow schematic showing water flow through the facility including: 1. sources of intake water, 2. contributing flow from the operation, 3. treatment units, and 4. discharge points and receiving waters(s).	

3. Contaminant information. In order to complete this section, the applicant will need to take a minimum of one sample of the untreated water and have it analyzed for **all** of the parameters listed in Appendix III. Historical data, (i.e., data taken no more than 2 years prior to the effective date of the permit) may be used if obtained pursuant to: i. Massachusetts' regulations 310 CMR 40.0000, the Massachusetts Contingency Plan ("Chapter 21E"); ii. New Hampshire's Title 50 RSA 485-A: Water Pollution and Waste Disposal or Title 50 RSA 485-C: Groundwater Protection Act; or iii. an EPA permit exclusion letter issued pursuant to 40 CFR 122.3, provided the data was analyzed with test methods that meet the requirements of this permit. Otherwise, a new sample shall be taken and analyzed.

a) Based on the analysis of the sample(s) of the untreated influent, the applicant must check the box of the sub-categories that the potential discharge falls within.

Gasoline Only	VOC Only	Primarily Metals	Urban Fill Sites	Contaminated Sumps	Mixed Contaminants	Aquifer Testing
Fuel Oils (and Other Oils) only	VOC with Other Contaminants	Petroleum with Other Contaminants	Listed Contaminated Sites	Contaminated Dredge Condensates	Hydrostatic Testing of Pipelines/Tanks	Well Development or Rehabilitation

b) Based on the analysis of the untreated influent, the applicant must indicate whether each listed chemical is **believed present** or **believed absent** in the potential discharge. Attach additional sheets as needed.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
1. Total Suspended Solids										
2. Total Residual Chlorine										
3. Total Petroleum Hydrocarbons										
4. Cyanide										
5. Benzene										
6. Toluene										
7. Ethylbenzene										
8. (m,p,o) Xylenes										
9. Total BTEX <sup>4</sup>										

<sup>4</sup>BTEX = Sum of Benzene, Toluene, Ethylbenzene, total Xylenes.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min- imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
10. Ethylene Dibromide (1,2- Dibromo-methane)										
11. Methyl-tert-Butyl Ether (MtBE)										
12. tert-Butyl Alcohol (TBA)										
13. tert-Amyl Methyl Ether (TAME)										
14. Naphthalene										
15. Carbon Tetra- chloride										
16. 1,4 Dichlorobenzene										
17. 1,2 Dichlorobenzene										
18. 1,3 Dichlorobenzene										
19. 1,1 Dichloroethane										
20. 1,2 Dichloroethane										
21. 1,1 Dichloroethylene										
22. cis-1,2 Dichloro- ethylene										
23. Dichloromethane (Methylene Chloride)										
24. Tetrachloroethylene										

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily Value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
25. 1,1,1 Trichloroethane										
26. 1,1,2 Trichloroethane										
27. Trichloroethylene										
28. Vinyl Chloride										
29. Acetone										
30. 1,4 Dioxane										
31. Total Phenols										
32. Pentachlorophenol										
33. Total Phthalates <sup>5</sup> (Phthalate esthers)										
34. Bis (2-Ethylhexyl) Phthalate [Di-(ethylhexyl) Phthalate]										
35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)										
a. Benzo(a) Anthracene										
b. Benzo(a) Pyrene										
c. Benzo(b)Fluoranthene										
d. Benzo(k) Fluoranthene										
e. Chrysene										

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<sup>5</sup>The sum of individual phthalate compounds.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
<b>f. Dibenzo(a,h) anthracene</b>										
<b>g. Indeno(1,2,3-cd) Pyrene</b>										
<b>36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)</b>										
<b>h. Acenaphthene</b>										
<b>i. Acenaphthylene</b>										
<b>j. Anthracene</b>										
<b>k. Benzo(ghi) Perylene</b>										
<b>l. Fluoranthene</b>										
<b>m. Fluorene</b>										
<b>n. Naphthalene-</b>										
<b>o. Phenanthrene</b>										
<b>p. Pyrene</b>										
<b>37. Total Polychlorinated Biphenyls (PCBs)</b>										
<b>38. Antimony</b>										
<b>39. Arsenic</b>										
<b>40. Cadmium</b>										
<b>41. Chromium III</b>										
<b>42. Chromium VI</b>										

PARAMETER	Believe Absent	Believe Present	# of Samples (1 minimum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
43. Copper										
44. Lead										
45. Mercury										
46. Nickel										
47. Selenium										
48. Silver										
49. Zinc										
50. Iron										
Other (describe):										

c) For discharges where **metals** are believed present, please fill out the following:

<p><i>Step 1:</i> Do any of the metals in the influent have a <b>reasonable potential</b> to exceed the effluent limits in Appendix III (i.e., the limits set at zero to five dilutions)? Y____ N____</p>	<p>If yes, which metals?</p>
<p><i>Step 2:</i> For any metals which have <b>reasonable potential</b> to exceed the <b>Appendix III</b> limits, calculate the <b>dilution factor (DF)</b> using the formula in Part I.A.3.c) (step 2) of the NOI instructions or as determined by the State prior to the submission of this NOI. What is the dilution factor for applicable metals? Metals: _____  DF: _____</p>	<p>Look up the limit calculated at the corresponding dilution factor in <b>Appendix IV</b>. Do any of the metals in the <b>influent</b> have the potential to exceed the corresponding <b>effluent</b> limits in Appendix IV (i.e., is the influent concentration above the limit set at the calculated dilution factor)? Y____ N____ If “Yes,” list which metals:</p>

**4. Treatment system information.** Please describe the treatment system using separate sheets as necessary, including:

a) A description of the treatment system, including a schematic of the proposed or existing treatment system:						
b) Identify each applicable treatment unit (check all that apply):	Frac. tank	Air stripper	Oil/water separator	Equalization tanks	Bag filter	GAC filter
	Chlorination	Dechlorination	Other (please describe):			
c) Proposed <b>average</b> and <b>maximum flow rates</b> (gallons per minute) for the discharge and the <b>design flow rate(s)</b> (gallons per minute) of the treatment system: Average flow rate of discharge _____ Maximum flow rate of treatment system _____ Design flow rate of treatment system _____						
d) A description of chemical additives being used or planned to be used (attach MSDS sheets):						

**5. Receiving surface water(s).** Please provide information about the receiving water(s), using separate sheets as necessary:

a) Identify the discharge pathway:	Direct _____	Within facility__	Storm drain____	River/brook____	Wetlands _____	Other (describe):
b) Provide a narrative description of the discharge pathway, including the name(s) of the receiving waters:						

c) Attach a detailed map(s) indicating the site location and location of the outfall to the receiving water:

1. For multiple discharges, number the discharges sequentially.

2. For indirect dischargers, indicate the location of the discharge to the indirect conveyance and the discharge to surface water

The map should also include the location and distance to the nearest sanitary sewer as well as the locus of nearby sensitive receptors (based on USGS topographical mapping), such as surface waters, drinking water supplies, and wetland areas.

d) Provide the state water quality classification of the receiving water \_\_\_\_\_,

e) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water \_\_\_\_\_ cfs

Please attach any calculation sheets used to support stream flow and dilution calculations.

f) Is the receiving water a listed 303(d) water quality impaired or limited water? Yes\_\_\_\_ No\_\_\_\_ If yes, for which pollutant(s)?

Is there a TMDL? Yes\_\_\_\_ No\_\_\_\_ If yes, for which pollutant(s)?

**6. Results of Consultation with Federal Services:** Please provide the following information according to requirements of Part I.B.4 and Appendices II and VII.

a) Are any listed threatened or endangered species, or designated critical habitat, in proximity to the discharge? Yes\_\_\_\_ No\_\_\_\_

Has any consultation with the federal services been completed? No\_\_\_\_ or is consultation underway? Yes\_\_\_\_ No\_\_\_\_

What were the results of the consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service (check one):

a “no jeopardy” opinion? \_\_\_\_\_ or written concurrence \_\_\_\_\_ on a finding that the discharges are not likely to adversely affect any endangered species or critical habitat?

b) Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility or site or in proximity to the discharge?

Yes\_\_\_\_ No\_\_\_\_ Have any state or tribal historic preservation officer been consulted in this determination (Massachusetts only)? Yes\_\_\_\_ No\_\_\_\_

**7. Supplemental information. :**

Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit.

**8. Signature Requirements:** The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22, including the following certification:

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Facility/Site Name:

Common Street Trust Property

Operator signature:

Title:

Contractor: Ronald K, Burns, Coler & Colantonio, Inc.

Date:

January 14, 2009

**B. Submission of NOI to EPA** - All operators applying for coverage under this General Permit must submit a written Notice of Intent (NOI) to EPA. Signed and completed NOI forms and attachments must be submitted to EPA-NE at:

US Environmental Protection Agency  
RGP-NOC Processing  
Municipal Assistance Unit (CMU),  
1 Congress Street, Suite 1100  
Boston, MA 02114-2023

or electronically mailed to [NPDES.Generalpermits@epa.gov](mailto:NPDES.Generalpermits@epa.gov),  
or faxed to the EPA Office at 617-918-0505.

If filling out the suggested NOI form electronically on EPA's website, the signature page must be signed and faxed or mailed to EPA at the phone number or address listed in Section I.B. below.

1. Filing with the states - A copy of any NOI form filed with EPA-NE must also be filed with state agencies. The state agency may elect to develop a state specific form or other information requirements.

a) Discharges in Massachusetts - In addition to the NOI, permit applicants must submit copies of the State Application Form BRPWM 12, Request for General Permit coverage for the RGP. The application form and the Transmittal Form for Permit Application and Payment, may be obtained from the Massachusetts Department of Environmental Protection (MA DEP) website at [www.state.ma.us/dep](http://www.state.ma.us/dep). Municipalities are fee-exempt, but should send a copy of the transmittal form to that address for project tracking purposes. All applicants should keep a copy of the transmittal form and a copy of the application package for their records.

1) A copy of the NOI, the transmittal form, a copy of the check, and Form BRPWM 12 should be sent to:

Massachusetts Department of Environmental Protection  
Division of Watershed Management  
627 Main Street, 2<sup>nd</sup> floor  
Worcester, MA 01608

2) A copy of the transmittal form and the appropriate fee should be sent to:

Massachusetts Department of Environmental Protection  
P.O. Box 4062  
Boston, MA 02111

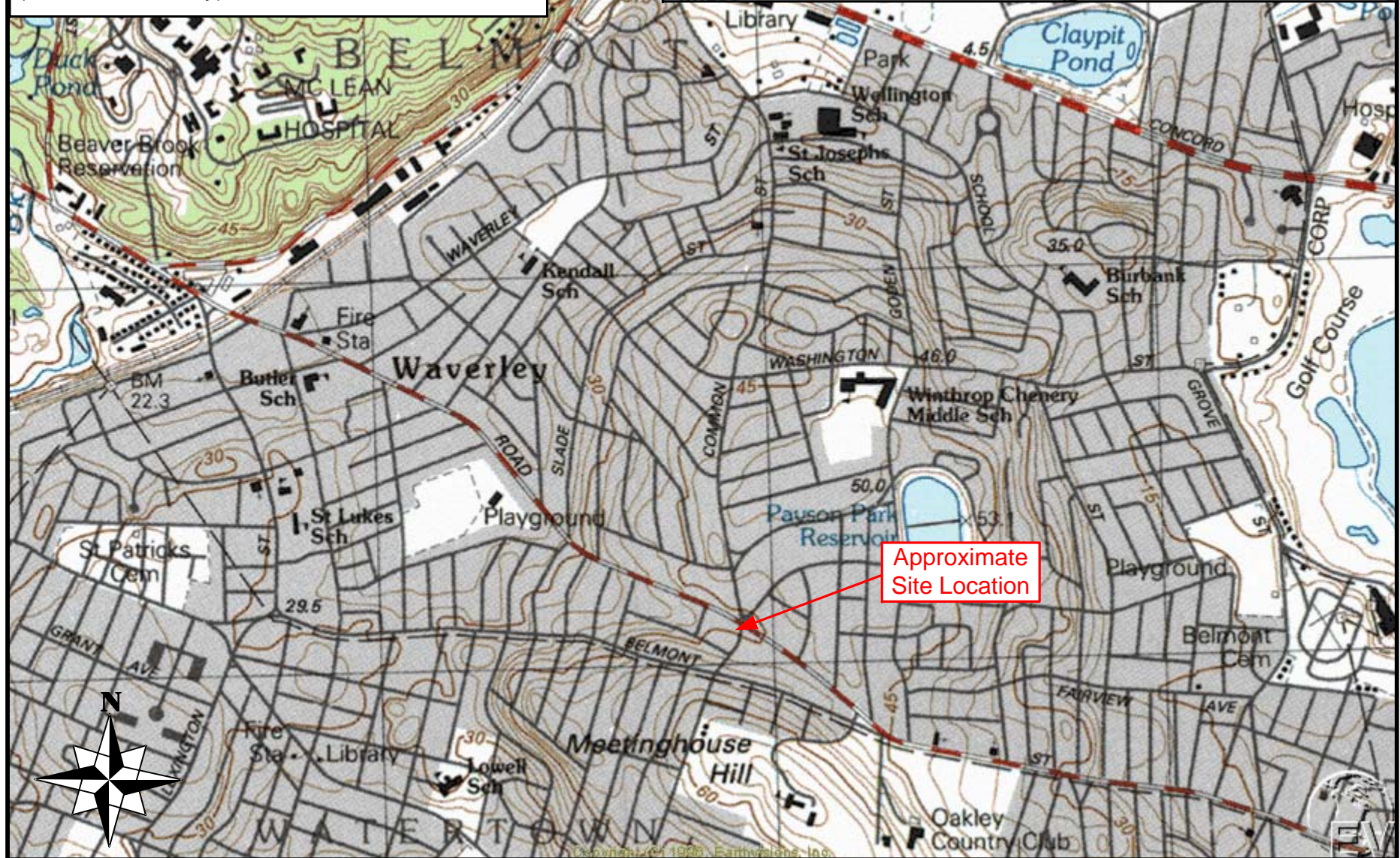
Please note: Applicants for discharges in Massachusetts should note that under 310 CMR 40.000, *as a matter of state law*, the general permit only applies to discharges that are **not** subject to the Massachusetts Contingency Plan (MCP) and 310 CMR 40.000. Therefore, discharges subject to the MCP are **not** required to fill out and submit the State Application Form BRPWM 12 or pay the state fees. However, they must submit a NOI to EPA.

b) Discharges in New Hampshire - applicants must provide a copy of the Notice of Intent to:

New Hampshire Department of Environmental Services  
Water Division  
Wastewater Engineering Bureau  
P.O. Box 95  
Concord, New Hampshire 03302-0095.

2. Filing with Municipalities - A copy of the NOI must be submitted to the municipality in which the proposed discharge would be located.

From: USGS Boston North, Massachusetts  
Topographic Quadrangle  
(Middlesex County)



REVISIONS:	
No.	DATE

GENERAL NOTES:

Plan based on Belmont Assessor maps, Figure No. 6-1 prepared by GeoSyntec Consultants of Acton, MA and prepared on 10/14/2004, field measurements collected by C&C, and utilities marked-out at the Site.

COLER & COLANTONIO & ENGINEERS AND SCIENTISTS

781-882-5400 Fax: 817-582-5490 101 Accord Park Drive Norwell, MA 02061-1655

TITLE:

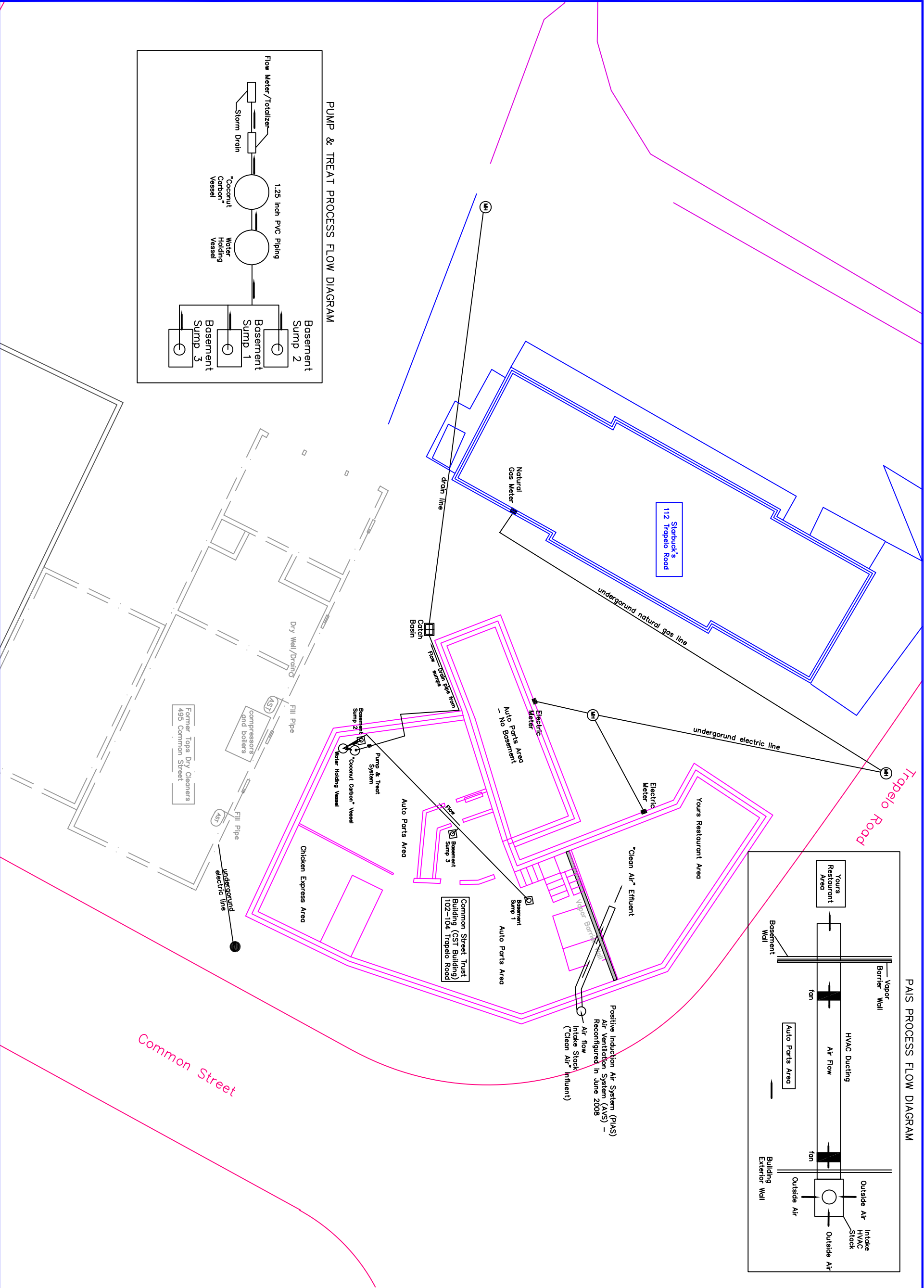
FIGURE 1 – Process Flow Diagram

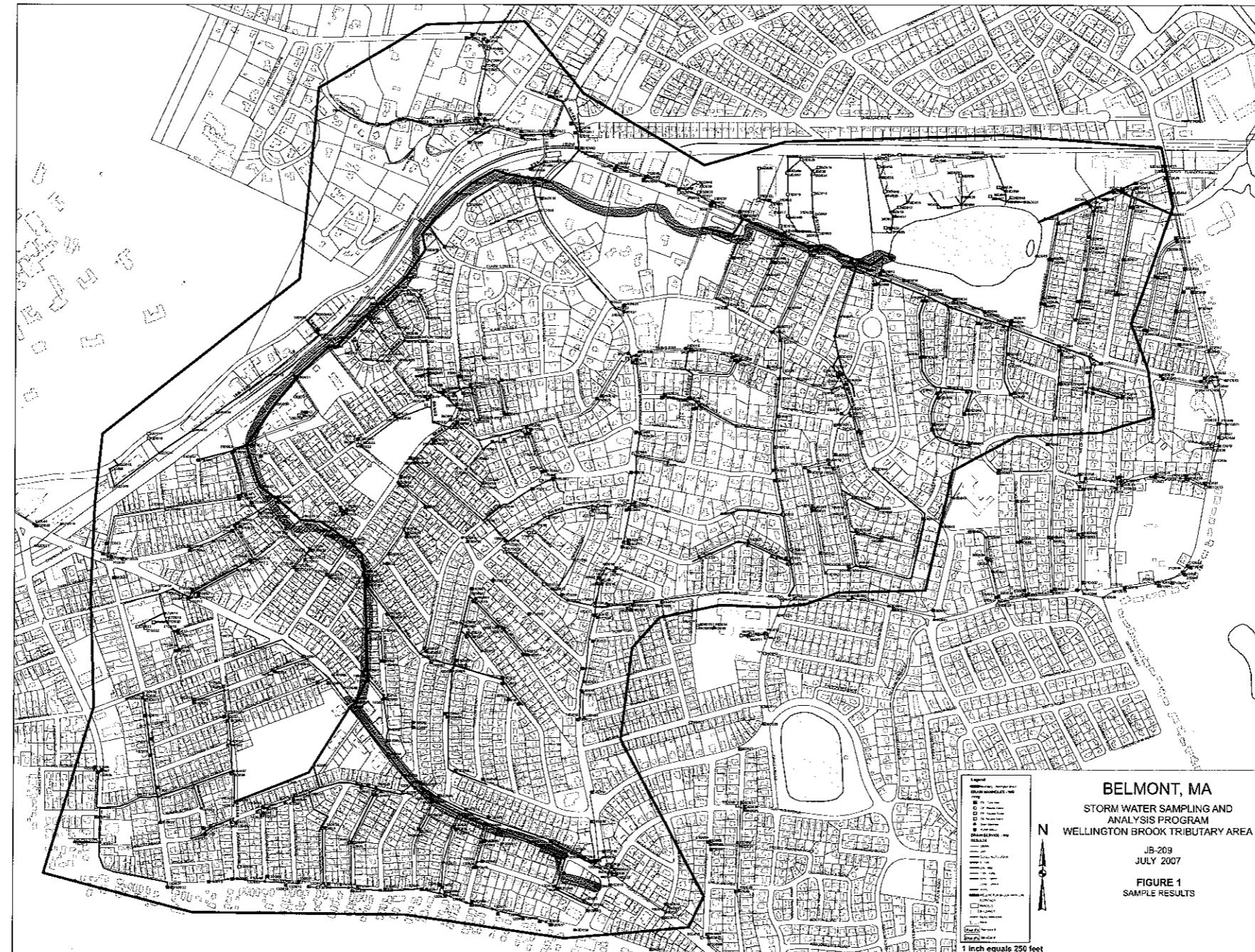
Pump and Treat System and the Positive Air Induction System

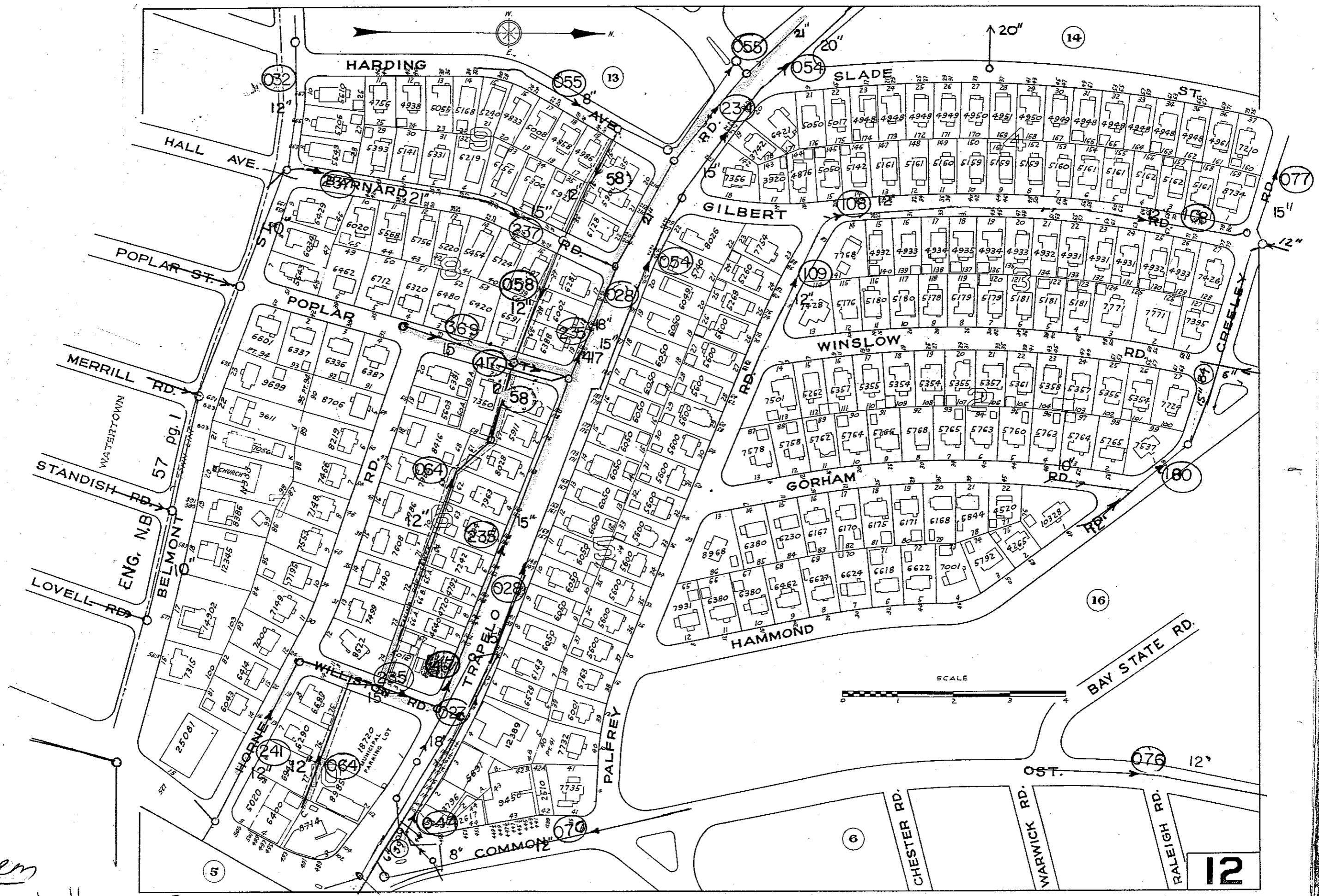
PREPARED FOR:

TOPS CLEANERS  
495 COMMON STREET  
BELMONT, MA 02478

DATE:	NOVEMBER 11, 2008
COMP./DESIGN:	GAC
CHECK:	RKB
DRAWN:	MLR
SCALE:	1" = 20'
hyperfile:	\\na001\endoclient\PROJECTS\DMT\11-1200\11-1208_topa
	Figure 2-NOV 08.dwg
DWG NO.:FIG. 2	SHEET: 1 OF 1







STORM

Discharges to Wellington Brook.

pages 12, 14, 16

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220      www.alphalab.com

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

**Client:** Coler & Colantonio

**Laboratory Job Number:** L0600756

**Address:** 101 Accord Park Drive

Norwell, MA 02061

**Date Received:** 17-JAN-2006

**Attn:** Mr. Mark Germano

**Date Reported:** 25-JAN-2006

**Project Number:** 11-1226

**Delivery Method:** Alpha

**Site:** NPDES PERMIT/TOP'S

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ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0600756-01	SUMP DISCHARGE	BELMONT, MA

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

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Authorized by:   
Technical Director

**ALPHA ANALYTICAL LABORATORIES**  
**NARRATIVE REPORT**

**Laboratory Job Number: L0600756**

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Report Submission

This report replaces the report issued on January 24, 2006. The report has been amended to include the compounds MBTE, TBA, TAME, and 1,4 Dioxane for L0600756.

Volatile Organics by Method 624

L0600756-01 has elevated limits of detection due to the 50x dilutions required by the elevated concentrations of non-target compounds in the sample.

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

<b>Laboratory Sample Number:</b> L0600756-01	<b>Date Collected:</b> 13-JAN-2006 15:30
<b>Sample Matrix:</b> SUMP DISCHARGE	<b>Date Received :</b> 17-JAN-2006
<b>Sample Matrix:</b> WATER	<b>Date Reported :</b> 25-JAN-2006
<b>Condition of Sample:</b> Satisfactory	<b>Field Prep:</b> None
<b>Number &amp; Type of Containers:</b> 4-Vial	

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
<hr/>						
Pesticides by GC 504				14 504.1	0124 10:40 0124 13:36	JB
1,2-Dibromoethane	ND	ug/l	0.019			
1,2-Dibromo-3-chloropropane	ND	ug/l	0.019			
<hr/>						
Volatile Organics by GC/MS 624				5 624	0120 14:31	MM
Methylene chloride	ND	ug/l	250			
1,1-Dichloroethane	ND	ug/l	75.			
Chloroform	ND	ug/l	75.			
Carbon tetrachloride	ND	ug/l	50.			
1,2-Dichloropropane	ND	ug/l	180			
Dibromochloromethane	ND	ug/l	50.			
1,1,2-Trichloroethane	ND	ug/l	75.			
2-Chloroethylvinyl ether	ND	ug/l	500			
Tetrachloroethene	290	ug/l	75.			
Chlorobenzene	ND	ug/l	180			
Trichlorofluoromethane	ND	ug/l	250			
1,2-Dichloroethane	ND	ug/l	75.			
1,1,1-Trichloroethane	ND	ug/l	100			
Bromodichloromethane	ND	ug/l	50.			
trans-1,3-Dichloropropene	ND	ug/l	75.			
cis-1,3-Dichloropropene	ND	ug/l	75.			
Bromoform	ND	ug/l	50.			
1,1,2,2-Tetrachloroethane	ND	ug/l	50.			
Benzene	ND	ug/l	50.			
Toluene	ND	ug/l	50.			
Ethylbenzene	ND	ug/l	50.			
Chloromethane	ND	ug/l	500			
Bromomethane	ND	ug/l	250			
Vinyl chloride	ND	ug/l	100			
Chloroethane	ND	ug/l	100			
1,1-Dichloroethene	ND	ug/l	50.			
trans-1,2-Dichloroethene	ND	ug/l	75.			
cis-1,2-Dichloroethene	ND	ug/l	50.			
Trichloroethene	ND	ug/l	50.			
1,2-Dichlorobenzene	ND	ug/l	250			
1,3-Dichlorobenzene	ND	ug/l	250			
1,4-Dichlorobenzene	ND	ug/l	250			
p/m-Xylene	ND	ug/l	100			
o-xylene	ND	ug/l	50.			

Comments: Complete list of References and Glossary of Terms found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

Laboratory Sample Number: L0600756-01  
SUMP DISCHARGE

PARAMETER	RESULT	UNITS	RDL	REF	METHOD	DATE		ID
						PREP	ANAL	
Volatile Organics by GC/MS 624 cont'd				5	624	0120 14:31 MM		
Xylene (Total)	ND	ug/l	100					
Styrene	ND	ug/l	50.					
Acetone	ND	ug/l	500					
Carbon disulfide	ND	ug/l	250					
2-Butanone	ND	ug/l	500					
Vinyl acetate	ND	ug/l	1000					
4-Methyl-2-pentanone	ND	ug/l	500					
2-Hexanone	ND	ug/l	500					
Acrolein	ND	ug/l	400					
Acrylonitrile	ND	ug/l	500					
Methyl tert butyl ether	5500	ug/l	1000					
1,4-Dioxane	ND	ug/l	100000					
Tert-Butyl Alcohol	ND	ug/l	5000					
Tertiary-Amyl Methyl Ether	ND	ug/l	1000					
Surrogate(s)	Recovery		QC Criteria					
Pentafluorobenzene	104.	%	80-120					
Fluorobenzene	106.	%	80-120					
4-Bromofluorobenzene	101.	%	80-120					

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS**

**Laboratory Job Number: L0600756**

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Volatile Organics by GC/MS 624 for sample(s) 01 (L0600573-01, WG227088-2)					
Methylene chloride	ND	ND	ug/l	NC	30
1,1-Dichloroethane	ND	ND	ug/l	NC	30
Chloroform	ND	ND	ug/l	NC	30
Carbon tetrachloride	ND	ND	ug/l	NC	30
1,2-Dichloropropane	ND	ND	ug/l	NC	30
Dibromochloromethane	ND	ND	ug/l	NC	30
1,1,2-Trichloroethane	ND	ND	ug/l	NC	30
Tetrachloroethene	ND	ND	ug/l	NC	30
Chlorobenzene	ND	ND	ug/l	NC	30
Trichlorofluoromethane	ND	ND	ug/l	NC	30
1,2-Dichloroethane	ND	ND	ug/l	NC	30
1,1,1-Trichloroethane	ND	ND	ug/l	NC	30
Bromodichloromethane	ND	ND	ug/l	NC	30
trans-1,3-Dichloropropene	ND	ND	ug/l	NC	30
cis-1,3-Dichloropropene	ND	ND	ug/l	NC	30
Bromoform	1.2	1.4	ug/l	15	30
1,1,2,2-Tetrachloroethane	ND	ND	ug/l	NC	30
Benzene	ND	ND	ug/l	NC	30
Toluene	ND	ND	ug/l	NC	30
Ethylbenzene	ND	ND	ug/l	NC	30
Chloromethane	ND	ND	ug/l	NC	30
Bromomethane	ND	ND	ug/l	NC	30
Vinyl chloride	ND	ND	ug/l	NC	30
Chloroethane	ND	ND	ug/l	NC	30
1,1-Dichloroethene	ND	ND	ug/l	NC	30
trans-1,2-Dichloroethene	ND	ND	ug/l	NC	30
cis-1,2-Dichloroethene	ND	ND	ug/l	NC	30
Trichloroethene	ND	ND	ug/l	NC	30
1,2-Dichlorobenzene	ND	ND	ug/l	NC	30
1,3-Dichlorobenzene	ND	ND	ug/l	NC	30
1,4-Dichlorobenzene	ND	ND	ug/l	NC	30
p/m-Xylene	ND	ND	ug/l	NC	30
o-Xylene	ND	ND	ug/l	NC	30
XYLENE (TOTAL)	ND	ND	ug/l	NC	30
Styrene	ND	ND	ug/l	NC	30
Acetone	ND	ND	ug/l	NC	30
Carbon disulfide	ND	ND	ug/l	NC	30
2-Butanone	ND	ND	ug/l	NC	30
Vinyl acetate	ND	ND	ug/l	NC	30
4-Methyl-2-pentanone	ND	ND	ug/l	NC	30
2-Hexanone	ND	ND	ug/l	NC	30
Acrolein	ND	ND	ug/l	NC	30
Acrylonitrile	ND	ND	ug/l	NC	30
Surrogate(s)	Recovery			QC Criteria	
Pentafluorobenzene	101.	91.0	%	80-120	
Fluorobenzene	102.	94.0	%	80-120	
4-Bromofluorobenzene	111.	99.0	%	80-120	

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH SPIKE ANALYSES**

**Laboratory Job Number: L0600756**

Parameter	% Recovery	QC Criteria
Pesticides by GC 504 LCS for sample(s) 01 (WG227604-2)		
1,2-Dibromoethane	99	
1,2-Dibromo-3-chloropropane	108	
Volatile Organics by GC/MS 624 LCS for sample(s) 01 (WG227088-11)		
Methylene chloride	103	10-221
1,1-Dichloroethane	90	59-155
Chloroform	81	51-138
Carbon tetrachloride	79	70-140
1,2-Dichloropropane	96	10-210
Dibromochloromethane	87	53-149
1,1,2-Trichloroethane	95	52-150
2-Chloroethylvinyl ether	107	10-305
Tetrachloroethene	92	64-148
Chlorobenzene	96	37-160
Trichlorofluoromethane	87	17-181
1,2-Dichloroethane	84	49-155
1,1,1-Trichloroethane	84	52-162
Bromodichloromethane	83	35-155
trans-1,3-Dichloropropene	85	17-183
cis-1,3-Dichloropropene	92	10-227
Bromoform	84	45-169
1,1,2,2-Tetrachloroethane	94	46-157
Benzene	98	37-151
Toluene	97	47-150
Ethylbenzene	100	37-162
Chloromethane	67	10-273
Bromomethane	88	10-242
Vinyl chloride	81	10-251
Chloroethane	104	14-230
1,1-Dichloroethene	91	10-234
trans-1,2-Dichloroethene	93	54-156
cis-1,2-Dichloroethene	95	60-140
Trichloroethene	95	71-157
1,2-Dichlorobenzene	94	18-190
1,3-Dichlorobenzene	95	59-156
1,4-Dichlorobenzene	96	18-190
p/m-Xylene	103	40-160
o-Xylene	102	40-160
XYLENE (TOTAL)	103	40-160
Styrene	90	40-160
Acetone	93	40-160
Carbon disulfide	83	40-160
2-Butanone	88	40-160
Vinyl acetate	69	40-160
4-Methyl-2-pentanone	113	40-160
2-Hexanone	103	40-160
Acrolein	110	40-160
Acrylonitrile	106	40-160

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0600756

Continued

Parameter	% Recovery	QC Criteria
Volatile Organics by GC/MS 624 LCS for sample(s) 01 (WG227088-11)		
Surrogate(s)		
Pentafluorobenzene	104	80-120
Fluorobenzene	103	80-120
4-Bromofluorobenzene	98	80-120
Pesticides by GC 504 SPIKE for sample(s) 01 (L0600756-01, WG227604-3)		
1,2-Dibromoethane	100	
1,2-Dibromo-3-chloropropane	107	
Volatile Organics by GC/MS 624 SPIKE for sample(s) 01 (L0600573-01, WG227088-1)		
Methylene chloride	80	10-221
1,1-Dichloroethane	78	59-155
Chloroform	75	51-138
Carbon tetrachloride	72	70-140
1,2-Dichloropropane	81	10-210
Dibromochloromethane	90	53-149
1,1,2-Trichloroethane	94	52-150
2-Chloroethylvinyl ether	76	10-305
Tetrachloroethene	86	64-148
Chlorobenzene	85	37-160
Trichlorofluoromethane	83	17-181
1,2-Dichloroethane	83	49-155
1,1,1-Trichloroethane	79	52-162
Bromodichloromethane	81	35-155
trans-1,3-Dichloropropene	80	17-183
cis-1,3-Dichloropropene	82	10-227
Bromoform	92	45-169
1,1,2,2-Tetrachloroethane	93	46-157
Benzene	85	35-151
Toluene	86	47-150
Ethylbenzene	90	37-162
Chloromethane	71	10-273
Bromomethane	77	10-242
Vinyl chloride	79	10-251
Chloroethane	89	14-230
1,1-Dichloroethene	77	10-234
trans-1,2-Dichloroethene	79	54-156
cis-1,2-Dichloroethene	82	60-140
Trichloroethene	82	71-157
1,2-Dichlorobenzene	89	18-190
1,3-Dichlorobenzene	87	59-156
1,4-Dichlorobenzene	89	18-190
p/m-Xylene	93	40-160
o-Xylene	92	40-160
XYLENE (TOTAL)	93	40-160
Styrene	81	40-160
Acetone	80	40-160

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0600756

Continued

Parameter	% Recovery	QC Criteria
Volatile Organics by GC/MS 624 SPIKE for sample(s) 01 (L0600573-01, WG227088-1)		
Carbon disulfide	94	40-160
2-Butanone	82	40-160
Vinyl acetate	116	40-160
4-Methyl-2-pentanone	113	40-160
2-Hexanone	104	40-160
Acrolein	90	40-160
Acrylonitrile	100	40-160
Surrogate(s)		
Pentafluorobenzene	101	80-120
Fluorobenzene	99	80-120
4-Bromofluorobenzene	100	80-120

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH BLANK ANALYSIS**

**Laboratory Job Number: L0600756**

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
Blank Analysis for sample(s) 01 (WG227604-1)						
Pesticides by GC 504				14 504.1	0124 10:40 0124 12:29 JB	
1,2-Dibromoethane	ND	ug/l	0.020			
1,2-Dibromo-3-chloropropane	ND	ug/l	0.020			
Blank Analysis for sample(s) 01 (WG227088-12)						
Volatile Organics by GC/MS 624				5 624	0120 13:54 MM	
Methylene chloride	ND	ug/l	5.0			
1,1-Dichloroethane	ND	ug/l	1.5			
Chloroform	ND	ug/l	1.5			
Carbon tetrachloride	ND	ug/l	1.0			
1,2-Dichloropropane	ND	ug/l	3.5			
Dibromochloromethane	ND	ug/l	1.0			
1,1,2-Trichloroethane	ND	ug/l	1.5			
2-Chloroethylvinyl ether	ND	ug/l	10.			
Tetrachloroethene	ND	ug/l	1.5			
Chlorobenzene	ND	ug/l	3.5			
Trichlorofluoromethane	ND	ug/l	5.0			
1,2-Dichloroethane	ND	ug/l	1.5			
1,1,1-Trichloroethane	ND	ug/l	2.0			
Bromodichloromethane	ND	ug/l	1.0			
trans-1,3-Dichloropropene	ND	ug/l	1.5			
cis-1,3-Dichloropropene	ND	ug/l	1.5			
Bromoform	ND	ug/l	1.0			
1,1,2,2-Tetrachloroethane	ND	ug/l	1.0			
Benzene	ND	ug/l	1.0			
Toluene	ND	ug/l	1.0			
Ethylbenzene	ND	ug/l	1.0			
Chloromethane	ND	ug/l	10.			
Bromomethane	ND	ug/l	5.0			
Vinyl chloride	ND	ug/l	2.0			
Chloroethane	ND	ug/l	2.0			
1,1-Dichloroethene	ND	ug/l	1.0			
trans-1,2-Dichloroethene	ND	ug/l	1.5			
cis-1,2-Dichloroethene	ND	ug/l	1.0			
Trichloroethene	ND	ug/l	1.0			
1,2-Dichlorobenzene	ND	ug/l	5.0			
1,3-Dichlorobenzene	ND	ug/l	5.0			
1,4-Dichlorobenzene	ND	ug/l	5.0			
p/m-Xylene	ND	ug/l	2.0			
o-xylene	ND	ug/l	1.0			
Xylene (Total)	ND	ug/l	2.0			
Styrene	ND	ug/l	1.0			
Acetone	ND	ug/l	10.			
Carbon disulfide	ND	ug/l	5.0			
2-Butanone	ND	ug/l	10.			
Vinyl acetate	ND	ug/l	20.			
4-Methyl-2-pentanone	ND	ug/l	10.			

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0600756

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01 (WG227088-12)							
Volatile Organics by GC/MS 624 cont'd				5	624	0120 13:54 MM	
2-Hexanone	ND	ug/l	10.				
Acrolein	ND	ug/l	8.0				
Acrylonitrile	ND	ug/l	10.				
Surrogate(s)	Recovery		QC Criteria				
Pentafluorobenzene	102.	%	80-120				
Fluorobenzene	104.	%	80-120				
4-Bromofluorobenzene	99.0	%	80-120				

**ALPHA ANALYTICAL LABORATORIES**  
**ADDENDUM I**

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**REFERENCES**

5. Methods for the Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A, Part 136, 40 CFR (Code of Federal Regulations).
14. Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. EPA/600/4-88/039, Revised July 1991.

**GLOSSARY OF TERMS AND SYMBOLS**

REF Reference number in which test method may be found.  
METHOD Method number by which analysis was performed.  
ID Initials of the analyst.  
ND Not detected in comparison to the reported detection limit.  
NI Not Ignitable.  
ug/cart Micrograms per Cartridge.

**LIMITATION OF LIABILITIES**

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.



Project Name: NPO's Permit / Top's

10600757

Project Location: Bedmont, MA

Project #: 11-122b

Project Manager: Mark G.

ALPHA Quote #:

## Turn-Around Time

☐ **RUSH** (only confirmed if pre-approved!)

Date Due: 1/24/02 Time:

10/10/00

**Other Project Specific Requirements/Comments/Detection Limits:**

**Sampler's  
Initials**

PC

IS YOUR  
PROJECT MCP ?

Date/Time

Container Type	V	U
Preservative	Hb	Hb

フ	フ
フ	フ

**Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock**

ANALYSIS  
624 / Vocs  
504 / Vocs

<input type="checkbox"/> Yes	<input type="checkbox"/> No	Are MCP Analytical Methods Required?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Are Drinking Water Samples Submitted?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Have you met minimum field QC requirements?

**MCP PRESUMPTIVE CERTAINTY - THESE QUESTIONS MUST BE ANSWERED**

Criteria

MA MCQ

63-1

Regulatory Requirements/Report Limits

## Billing Information

<input checked="" type="checkbox"/> Same as Client info	PO #:
---	-------

## SAMPLE HANDLING

**Filtration**

☐ Done

☐ Not needed

☐ Lab to do

**Preservation**

☐ Lab to do

(Please specify below)

Sample Specific Comments

ALPHA ANALYTICAL LABORATORIES

Eight Walkup Drive  
Westborough, Massachusetts 01581-1019  
(508) 898-9220      www.alphalab.com

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

CERTIFICATE OF ANALYSIS

**Client:** Coler & Colantonio      **Laboratory Job Number:** L0600518  
**Address:** 101 Accord Park Drive  
Norwell, MA 02061      **Date Received:** 12-JAN-2006  
**Attn:** Mr. Paul Cinquegrano      **Date Reported:** 19-JAN-2006  
**Project Number:** 11-12      **Delivery Method:** Alpha  
**Site:** TOPS CLEANERS

---

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
L0600518-01	SUMP DISCHARGE	BELMONT, MA

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

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Authorized by:

  
Technical Director

**ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS**

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

<b>Laboratory Sample Number:</b> L0600518-01	<b>Date Collected:</b> 12-JAN-2006 14:00
<b>Sample Matrix:</b> SUMP DISCHARGE	<b>Date Received :</b> 12-JAN-2006
<b>Sample Matrix:</b> WATER	<b>Date Reported :</b> 19-JAN-2006
<b>Condition of Sample:</b> Satisfactory	<b>Field Prep:</b> None
<b>Number &amp; Type of Containers:</b> 10-Amber,4-Plastic	

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Solids, Total Suspended	8.4	mg/l	5.0	4 160.2		0118 10:00	DT
Cyanide, Total	0.035	mg/l	0.005	4 335.2	0117 10:00	0117 15:49	ED
Chlorine, Total Residual	ND	mg/l	0.05	4 330.1		0112 20:40	HG
TPH	ND	mg/l	4.00	74 1664A	0118 10:15	0119 14:30	AT
Phenolics, Total	ND	mg/l	0.03	4 420.1		0116 11:00	AT
Chromium, Hexavalent	ND	mg/l	0.02	30 3500CR-D	0112 21:40	0112 21:40	HG
Total Metals				19 200.7			
Antimony, Total	ND	mg/l	0.005	3 200.9	0116 18:40	0118 15:05	PY
Arsenic, Total	ND	mg/l	0.005	19 200.7	0116 18:40	0117 13:57	RW
Cadmium, Total	ND	mg/l	0.0002	4 213.2	0116 18:40	0118 12:24	PY
Chromium, Total	ND	mg/l	0.01	19 200.7	0116 18:40	0117 13:57	RW
Copper, Total	ND	mg/l	0.01	19 200.7	0116 18:40	0117 13:57	RW
Iron, Total	0.43	mg/l	0.05	19 200.7	0116 18:40	0117 13:57	RW
Lead, Total	0.002	mg/l	0.001	3 200.9	0116 18:40	0118 19:48	PY
Mercury, Total	ND	mg/l	0.0002	4 245.2	0116 16:05	0117 10:12	DM
Nickel, Total	ND	mg/l	0.025	19 200.7	0116 18:40	0117 13:57	RW
Selenium, Total	ND	mg/l	0.005	19 200.7	0116 18:40	0117 13:57	RW
Silver, Total	ND	mg/l	0.0002	4 272.2	0116 18:40	0118 22:08	RC
Zinc, Total	ND	mg/l	0.050	19 200.7	0116 18:40	0117 13:57	RW
SVOC's by GC/MS 8270				1 8270C	0113 12:30	0116 20:07	RL
Acenaphthene	ND	ug/l	4.9				
Benzidine	ND	ug/l	49.				
1,2,4-Trichlorobenzene	ND	ug/l	4.9				
Hexachlorobenzene	ND	ug/l	4.9				
Bis(2-chloroethyl)ether	ND	ug/l	4.9				
1-Chloronaphthalene	ND	ug/l	4.9				
2-Chloronaphthalene	ND	ug/l	5.9				
1,2-Dichlorobenzene	ND	ug/l	4.9				
1,3-Dichlorobenzene	ND	ug/l	4.9				
1,4-Dichlorobenzene	ND	ug/l	4.9				
3,3'-Dichlorobenzidine	ND	ug/l	49.				

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

**Laboratory Sample Number:** L0600518-01  
SUMP DISCHARGE

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
SVOC's by GC/MS 8270 cont'd				1 8270C	0113 12:30	0116 20:07	RL
2,4-Dinitrotoluene	ND	ug/l	5.9				
2,6-Dinitrotoluene	ND	ug/l	4.9				
Azobenzene	ND	ug/l	4.9				
Fluoranthene	ND	ug/l	4.9				
4-Chlorophenyl phenyl ether	ND	ug/l	4.9				
4-Bromophenyl phenyl ether	ND	ug/l	4.9				
Bis(2-chloroisopropyl)ether	ND	ug/l	4.9				
Bis(2-chloroethoxy)methane	ND	ug/l	4.9				
Hexachlorobutadiene	ND	ug/l	9.8				
Hexachlorocyclopentadiene	ND	ug/l	9.8				
Hexachloroethane	ND	ug/l	4.9				
Isophorone	ND	ug/l	4.9				
Naphthalene	ND	ug/l	4.9				
Nitrobenzene	ND	ug/l	4.9				
NDPA/DPA	ND	ug/l	15.				
n-Nitrosodi-n-propylamine	ND	ug/l	4.9				
Bis(2-ethylhexyl)phthalate	ND	ug/l	9.8				
Butyl benzyl phthalate	ND	ug/l	4.9				
Di-n-butylphthalate	ND	ug/l	4.9				
Di-n-octylphthalate	ND	ug/l	4.9				
Diethyl phthalate	ND	ug/l	4.9				
Dimethyl phthalate	ND	ug/l	4.9				
Benzo(a)anthracene	ND	ug/l	4.9				
Benzo(a)pyrene	ND	ug/l	4.9				
Benzo(b)fluoranthene	ND	ug/l	4.9				
Benzo(k)fluoranthene	ND	ug/l	4.9				
Chrysene	ND	ug/l	4.9				
Acenaphthylene	ND	ug/l	4.9				
Anthracene	ND	ug/l	4.9				
Benzo(ghi)perylene	ND	ug/l	4.9				
Fluorene	ND	ug/l	4.9				
Phenanthrene	ND	ug/l	4.9				
Dibenzo(a,h)anthracene	ND	ug/l	4.9				
Indeno(1,2,3-cd)pyrene	ND	ug/l	6.8				
Pyrene	ND	ug/l	4.9				
Benzo(e)pyrene	ND	ug/l	4.9				
Biphenyl	ND	ug/l	4.9				
Perylene	ND	ug/l	4.9				
Aniline	ND	ug/l	9.8				
4-Chloroaniline	ND	ug/l	4.9				
1-Methylnaphthalene	ND	ug/l	4.9				
2-Nitroaniline	ND	ug/l	4.9				
3-Nitroaniline	ND	ug/l	4.9				
4-Nitroaniline	ND	ug/l	6.8				
Dibenzofuran	ND	ug/l	4.9				
a,a-Dimethylphenethylamine	ND	ug/l	49.				
Hexachloropropene	ND	ug/l	9.8				
Nitrosodi-n-butylamine	ND	ug/l	9.8				
2-Methylnaphthalene	ND	ug/l	4.9				

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

**Laboratory Sample Number:** L0600518-01  
SUMP DISCHARGE

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
SVOC's by GC/MS 8270 cont'd				1 8270C	0113 12:30	0116 20:07	RL
1,2,4,5-Tetrachlorobenzene	ND	ug/l	20.				
Pentachlorobenzene	ND	ug/l	20.				
a-Naphthylamine	ND	ug/l	20.				
b-Naphthylamine	ND	ug/l	20.				
Phenacetin	ND	ug/l	9.8				
Dimethoate	ND	ug/l	20.				
4-Aminobiphenyl	ND	ug/l	9.8				
Pentachloronitrobenzene	ND	ug/l	9.8				
Isodrin	ND	ug/l	9.8				
p-Dimethylaminoazobenzene	ND	ug/l	9.8				
Chlorobenzilate	ND	ug/l	20.				
3-Methylcholanthrene	ND	ug/l	20.				
Ethyl Methanesulfonate	ND	ug/l	15.				
Acetophenone	ND	ug/l	20.				
Nitrosodipiperidine	ND	ug/l	20.				
7,12-Dimethylbenz(a)anthracene	ND	ug/l	9.8				
n-Nitrosodimethylamine	ND	ug/l	49.				
2,4,6-Trichlorophenol	ND	ug/l	4.9				
p-Chloro-m-cresol	ND	ug/l	4.9				
2-Chlorophenol	ND	ug/l	5.9				
2,4-Dichlorophenol	ND	ug/l	9.8				
2,4-Dimethylphenol	ND	ug/l	9.8				
2-Nitrophenol	ND	ug/l	20.				
4-Nitrophenol	ND	ug/l	9.8				
2,4-Dinitrophenol	ND	ug/l	20.				
4,6-Dinitro-o-cresol	ND	ug/l	20.				
Pentachlorophenol	ND	ug/l	20.				
Phenol	ND	ug/l	6.8				
2-Methylphenol	ND	ug/l	5.9				
3-Methylphenol/4-Methylphenol	ND	ug/l	5.9				
2,4,5-Trichlorophenol	ND	ug/l	4.9				
2,6-Dichlorophenol	ND	ug/l	9.8				
Benzoic Acid	ND	ug/l	49.				
Benzyl Alcohol	ND	ug/l	9.8				
Carbazole	ND	ug/l	4.9				
Pyridine	ND	ug/l	49.				
2-Picoline	ND	ug/l	20.				
Pronamide	ND	ug/l	20.				
Methyl methanesulfonate	ND	ug/l	20.				
Surrogate(s)	Recovery		QC Criteria				
2-Fluorophenol	37.0	%	21-120				
Phenol-d6	30.0	%	10-120				
Nitrobenzene-d5	64.0	%	23-120				
2-Fluorobiphenyl	62.0	%	43-120				
2,4,6-Tribromophenol	81.0	%	10-120				
4-Terphenyl-d14	86.0	%	33-120				
PAH by GC/MS SIM 8270M				1 8270C-M	0113 12:30	0116 13:22	RL

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

**Laboratory Sample Number:** L0600518-01  
SUMP DISCHARGE

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
PAH by GC/MS SIM 8270M cont'd				1	8270C-M	0113 12:30 0116 13:22	RL
Acenaphthene	ND	ug/l	0.20				
2-Chloronaphthalene	ND	ug/l	0.20				
Fluoranthene	ND	ug/l	0.20				
Hexachlorobutadiene	ND	ug/l	0.49				
Naphthalene	ND	ug/l	0.20				
Benzo(a)anthracene	ND	ug/l	0.20				
Benzo(a)pyrene	ND	ug/l	0.20				
Benzo(b)fluoranthene	ND	ug/l	0.20				
Benzo(k)fluoranthene	ND	ug/l	0.20				
Chrysene	ND	ug/l	0.20				
Acenaphthylene	ND	ug/l	0.20				
Anthracene	ND	ug/l	0.20				
Benzo(ghi)perylene	ND	ug/l	0.20				
Fluorene	ND	ug/l	0.20				
Phenanthrene	ND	ug/l	0.20				
Dibenzo(a,h)anthracene	ND	ug/l	0.20				
Indeno(1,2,3-cd)Pyrene	ND	ug/l	0.20				
Pyrene	ND	ug/l	0.20				
1-Methylnaphthalene	ND	ug/l	0.20				
2-Methylnaphthalene	ND	ug/l	0.20				
Pentachlorophenol	ND	ug/l	0.78				
Hexachlorobenzene	ND	ug/l	0.78				
Perylene	ND	ug/l	0.20				
Biphenyl	ND	ug/l	0.20				
2,6-Dimethylnaphthalene	ND	ug/l	0.20				
1-Methylphenanthrene	ND	ug/l	0.20				
Benzo(e)Pyrene	ND	ug/l	0.20				
Hexachloroethane	ND	ug/l	0.78				
Surrogate(s)	Recovery		QC Criteria				
2-Fluorophenol	43.0	%	21-120				
Phenol-d6	34.0	%	10-120				
Nitrobenzene-d5	65.0	%	23-120				
2-Fluorobiphenyl	56.0	%	43-120				
2,4,6-Tribromophenol	61.0	%	10-120				
4-Terphenyl-d14	58.0	%	33-120				
Polychlorinated Biphenyls				5	608	0113 10:45 0117 03:04	SS
Aroclor 1221	ND	ug/l	0.258				
Aroclor 1232	ND	ug/l	0.258				
Aroclor 1242/1016	ND	ug/l	0.258				
Aroclor 1248	ND	ug/l	0.258				
Aroclor 1254	ND	ug/l	0.258				
Aroclor 1260	ND	ug/l	0.258				
Surrogate(s)	Recovery		QC Criteria				
2,4,5,6-Tetrachloro-m-xylene	51.0	%	30-150				
Decachlorobiphenyl	68.0	%	30-150				

Comments: Complete list of References and Glossary of Terms found in Addendum I

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS**

**Laboratory Job Number: L0600518**

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Solids, Total Suspended for sample(s) 01 (L0600451-01, WG227043-2)					
Solids, Total Suspended	160	160	mg/l	0	20
Cyanide, Total for sample(s) 01 (L0600488-04, WG226776-4)					
Cyanide, Total	0.138	0.137	mg/l	1	30
Chlorine, Total Residual for sample(s) 01 (L0600518-01, WG226604-3)					
Chlorine, Total Residual	ND	ND	mg/l	NC	
TPH for sample(s) 01 (L0600518-01, WG227211-4)					
TPH	ND	ND	mg/l	NC	34
Phenolics, Total for sample(s) 01 (L0600518-01, WG226902-4)					
Phenolics, Total	ND	ND	mg/l	NC	
Chromium, Hexavalent for sample(s) 01 (L0600518-01, WG226611-4)					
Chromium, Hexavalent	ND	ND	mg/l	NC	
Total Metals for sample(s) 01 (L0600518-01, WG226877-1)					
Antimony, Total	ND	ND	mg/l	NC	
Arsenic, Total	ND	ND	mg/l	NC	
Cadmium, Total	ND	ND	mg/l	NC	
Chromium, Total	ND	ND	mg/l	NC	
Copper, Total	ND	ND	mg/l	NC	
Iron, Total	0.43	0.43	mg/l	0	
Lead, Total	0.002	0.003	mg/l	11	
Nickel, Total	ND	ND	mg/l	NC	
Selenium, Total	ND	ND	mg/l	NC	
Silver, Total	ND	ND	mg/l	NC	
Zinc, Total	ND	0.056	mg/l	NC	
Total Metals for sample(s) 01 (L0600137-01, WG226850-3)					
Mercury, Total	ND	ND	mg/l	NC	
Polychlorinated Biphenyls for sample(s) 01 (L0600518-01, WG226718-4)					
Aroclor 1221	ND	ND	ug/l	NC	30
Aroclor 1232	ND	ND	ug/l	NC	30
Aroclor 1242/1016	ND	ND	ug/l	NC	30
Aroclor 1248	ND	ND	ug/l	NC	30
Aroclor 1254	ND	ND	ug/l	NC	30
Aroclor 1260	ND	ND	ug/l	NC	30
Surrogate(s)	Recovery				QC Criteria
2,4,5,6-Tetrachloro-m-xylene	51.0	62.0	%		30-150
Decachlorobiphenyl	68.0	74.0	%		30-150

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH SPIKE ANALYSES**

**Laboratory Job Number: L0600518**

Parameter	% Recovery	QC Criteria
Cyanide, Total LCS for sample(s) 01 (WG226776-2)		
Cyanide, Total	103	90-110
Chlorine, Total Residual LCS for sample(s) 01 (WG226604-2)		
Chlorine, Total Residual	105	
TPH LCS for sample(s) 01 (WG227211-2)		
TPH	85	64-132
Phenolics, Total LCS for sample(s) 01 (WG226902-2)		
Phenolics, Total	94	
Chromium, Hexavalent LCS for sample(s) 01 (WG226611-2)		
Chromium, Hexavalent	99	
Total Metals LCS for sample(s) 01 (WG226877-4)		
Antimony, Total	99	
Arsenic, Total	102	
Cadmium, Total	90	
Chromium, Total	100	
Copper, Total	96	
Iron, Total	95	
Lead, Total	107	
Nickel, Total	98	
Selenium, Total	102	
Silver, Total	104	
Zinc, Total	97	
Total Metals LCS for sample(s) 01 (WG226850-1)		
Mercury, Total	102	
SVOC's by GC/MS 8270 LCS for sample(s) 01 (WG226714-2)		
Acenaphthene	76	46-118
1,2,4-Trichlorobenzene	72	39-98
2-Chloronaphthalene	80	40-140
1,2-Dichlorobenzene	59	40-140
1,4-Dichlorobenzene	56	36-97
2,4-Dinitrotoluene	96	24-96
2,6-Dinitrotoluene	100	40-140
Fluoranthene	90	40-140
4-Chlorophenyl phenyl ether	84	40-140
n-Nitrosodi-n-propylamine	66	41-116
Butyl benzyl phthalate	88	40-140
Anthracene	54	40-140
Pyrene	85	26-127
Hexachloropropene	66	40-140
P-Chloro-M-Cresol	82	23-97
2-Chlorophenol	64	27-123
2-Nitrophenol	74	30-130

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH SPIKE ANALYSES**

Laboratory Job Number: L0600518

Continued

Parameter	% Recovery	QC Criteria
SVOC's by GC/MS 8270 LCS for sample(s) 01 (WG226714-2)		
4-Nitrophenol	46	10-80
2,4-Dinitrophenol	92	30-130
Pentachlorophenol	80	9-103
Phenol	28	12-110
Surrogate(s)		
2-Fluorophenol	42	21-120
Phenol-d6	37	10-120
Nitrobenzene-d5	68	23-120
2-Fluorobiphenyl	81	43-120
2,4,6-Tribromophenol	97	10-120
4-Terphenyl-d14	99	33-120
PAH by GC/MS SIM 8270M LCS for sample(s) 01 (WG226715-2)		
Acenaphthene	59	46-118
2-Chloronaphthalene	70	
Fluoranthene	84	
Anthracene	56	
Pyrene	92	26-127
Pentachlorophenol	72	9-103
Surrogate(s)		
2-Fluorophenol	51	21-120
Phenol-d6	41	10-120
Nitrobenzene-d5	71	23-120
2-Fluorobiphenyl	57	43-120
2,4,6-Tribromophenol	61	10-120
4-Terphenyl-d14	59	33-120
Polychlorinated Biphenyls LCS for sample(s) 01 (WG226718-2)		
Aroclor 1242/1016	76	40-140
Aroclor 1260	76	40-140
Surrogate(s)		
2,4,5,6-Tetrachloro-m-xylene	70	30-150
Decachlorobiphenyl	54	30-150
Cyanide, Total SPIKE for sample(s) 01 (L0600455-02, WG226776-3)		
Cyanide, Total	4	80-120
TPH SPIKE for sample(s) 01 (L0600575-01, WG227211-3)		
TPH	84	64-132
Phenolics, Total SPIKE for sample(s) 01 (L0600384-02, WG226902-3)		
Phenolics, Total	90	

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0600518

Continued

Parameter	% Recovery	QC Criteria
Chromium, Hexavalent SPIKE for sample(s) 01 (L0600518-01, WG226611-3)		
Chromium, Hexavalent	95	
Total Metals SPIKE for sample(s) 01 (L0600518-01, WG226877-2)		
Antimony, Total	103	
Arsenic, Total	109	
Cadmium, Total	100	
Chromium, Total	100	
Copper, Total	104	
Iron, Total	97	
Lead, Total	116	
Nickel, Total	101	
Selenium, Total	106	
Silver, Total	110	
Zinc, Total	114	
Total Metals SPIKE for sample(s) 01 (L0600137-01, WG226850-2)		
Mercury, Total	117	
Polychlorinated Biphenyls SPIKE for sample(s) 01 (L0600518-01, WG226718-3)		
Aroclor 1242/1016	63	40-140
Aroclor 1260	76	40-140
Surrogate(s)		
2,4,5,6-Tetrachloro-m-xylene	53	30-150
Decachlorobiphenyl	74	30-150

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH MS/MSD ANALYSIS**

**Laboratory Job Number: L0600518**

Parameter	MS %	MSD %	RPD	RPD Limit	MS/MSD Limits
SVOC's by GC/MS 8270 for sample(s) 01 (L0600518-01, WG226714-4)					
Acenaphthene	71	71	0	30	46-118
1,2,4-Trichlorobenzene	66	66	0	30	39-98
2-Chloronaphthalene	75	75	0	30	40-140
1,2-Dichlorobenzene	56	61	9	30	40-140
1,4-Dichlorobenzene	52	56	7	30	36-97
2,4-Dinitrotoluene	94	94	0	30	24-96
2,6-Dinitrotoluene	99	94	5	30	40-140
Fluoranthene	94	89	5	30	40-140
4-Chlorophenyl phenyl ether	80	80	0	30	40-140
n-Nitrosodi-n-propylamine	61	61	0	30	41-116
Butyl benzyl phthalate	94	85	10	30	40-140
Anthracene	56	56	0	30	40-140
Pyrene	85	85	0	30	26-127
Hexachloropropene	66	66	0	30	40-140
p-Chloro-M-Cresol	78	80	3	30	23-97
2-Chlorophenol	63	66	5	30	27-123
2-Nitrophenol	73	75	3	30	30-130
4-Nitrophenol	71	71	0	30	10-80
2,4-Dinitrophenol	96	100	4	30	30-130
Pentachlorophenol	85	82	4	30	9-103
Phenol	40	42	5	30	12-110
Surrogate(s)					
2-Fluorophenol	49	56	13		21-120
Phenol-d6	51	57	11		10-120
Nitrobenzene-d5	62	67	8		23-120
2-Fluorobiphenyl	73	74	1		43-120
2,4,6-Tribromophenol	94	93	1		10-120
4-Terphenyl-d14	96	94	2		33-120
PAH by GC/MS SIM 8270M for sample(s) 01 (L0600518-01, WG226715-4)					
Acenaphthene	52	56	7	40	46-118
2-Chloronaphthalene	61	61	0	40	
Fluoranthene	89	89	0	40	
Anthracene	52	47	10	40	
Pyrene	89	85	5	40	26-127
Pentachlorophenol	80	80	0	40	9-103
Surrogate(s)					
2-Fluorophenol	64	71	10		21-120
Phenol-d6	61	68	11		10-120
Nitrobenzene-d5	77	83	8		23-120
2-Fluorobiphenyl	62	63	2		43-120
2,4,6-Tribromophenol	68	70	3		10-120
4-Terphenyl-d14	68	71	4		33-120

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH BLANK ANALYSIS**

Laboratory Job Number: L0600518

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
Blank Analysis for sample(s) 01 (WG227043-1)						
Solids, Total Suspended	ND	mg/l	5.0	4 160.2	0118 10:00	DT
Blank Analysis for sample(s) 01 (WG226776-1)						
Cyanide, Total	ND	mg/l	0.005	4 335.2	0117 10:00 0117 15:41	ED
Blank Analysis for sample(s) 01 (WG226604-1)						
Chlorine, Total Residual	ND	mg/l	0.05	4 330.1	0112 20:40	HG
Blank Analysis for sample(s) 01 (WG227211-1)						
TPH	ND	mg/l	4.00	74 1664A	0118 10:15 0119 14:30	AT
Blank Analysis for sample(s) 01 (WG226902-1)						
Phenolics, Total	ND	mg/l	0.03	4 420.1	0116 11:00	AT
Blank Analysis for sample(s) 01 (WG226611-1)						
Chromium, Hexavalent	ND	mg/l	0.02	30 3500CR-D	0112 21:40 0112 21:40	HG
Blank Analysis for sample(s) 01 (WG226877-3)						
Total Metals				19 200.7		
Antimony, Total	ND	mg/l	0.005	3 200.9	0116 18:40 0118 14:52	PY
Arsenic, Total	ND	mg/l	0.005	19 200.7	0116 18:40 0117 13:51	RW
Cadmium, Total	ND	mg/l	0.0002	4 213.2	0116 18:40 0118 12:13	PY
Chromium, Total	ND	mg/l	0.01	19 200.7	0116 18:40 0117 13:51	RW
Copper, Total	ND	mg/l	0.01	19 200.7	0116 18:40 0117 13:51	RW
Iron, Total	ND	mg/l	0.05	19 200.7	0116 18:40 0117 13:51	RW
Lead, Total	ND	mg/l	0.001	3 200.9	0116 18:40 0118 19:34	PY
Nickel, Total	ND	mg/l	0.025	19 200.7	0116 18:40 0117 13:51	RW
Selenium, Total	ND	mg/l	0.005	19 200.7	0116 18:40 0117 13:51	RW
Silver, Total	ND	mg/l	0.0002	4 272.2	0116 18:40 0118 21:55	RC
Zinc, Total	ND	mg/l	0.050	19 200.7	0116 18:40 0117 13:51	RW
Blank Analysis for sample(s) 01 (WG226850-4)						
Total Metals						
Mercury, Total	ND	mg/l	0.0002	4 245.2	0116 16:05 0117 09:43	DM
Blank Analysis for sample(s) 01 (WG226714-1)						
SVOC's by GC/MS 8270				1 8270C	0113 12:30 0116 18:27	RL
Acenaphthene	ND	ug/l	5.0			
Benzidine	ND	ug/l	50.			

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH BLANK ANALYSIS**

Laboratory Job Number: L0600518

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01 (WG226714-1)							
SVOC's by GC/MS 8270 cont'd				1 8270C	0113 12:30	0116 18:27	RL
1,2,4-Trichlorobenzene	ND	ug/l	5.0				
Hexachlorobenzene	ND	ug/l	5.0				
Bis(2-chloroethyl)ether	ND	ug/l	5.0				
1-Chloronaphthalene	ND	ug/l	5.0				
2-Chloronaphthalene	ND	ug/l	6.0				
1,2-Dichlorobenzene	ND	ug/l	5.0				
1,3-Dichlorobenzene	ND	ug/l	5.0				
1,4-Dichlorobenzene	ND	ug/l	5.0				
3,3'-Dichlorobenzidine	ND	ug/l	50.				
2,4-Dinitrotoluene	ND	ug/l	6.0				
2,6-Dinitrotoluene	ND	ug/l	5.0				
Azobenzene	ND	ug/l	5.0				
Fluoranthene	ND	ug/l	5.0				
4-Chlorophenyl phenyl ether	ND	ug/l	5.0				
4-Bromophenyl phenyl ether	ND	ug/l	5.0				
Bis(2-chloroisopropyl)ether	ND	ug/l	5.0				
Bis(2-chloroethoxy)methane	ND	ug/l	5.0				
Hexachlorobutadiene	ND	ug/l	10.				
Hexachlorocyclopentadiene	ND	ug/l	10.				
Hexachloroethane	ND	ug/l	5.0				
Isophorone	ND	ug/l	5.0				
Naphthalene	ND	ug/l	5.0				
Nitrobenzene	ND	ug/l	5.0				
NDPA/DPA	ND	ug/l	15.				
n-Nitrosodi-n-propylamine	ND	ug/l	5.0				
Bis(2-ethylhexyl)phthalate	ND	ug/l	10.				
Butyl benzyl phthalate	ND	ug/l	5.0				
Di-n-butylphthalate	ND	ug/l	5.0				
Di-n-octylphthalate	ND	ug/l	5.0				
Diethyl phthalate	ND	ug/l	5.0				
Dimethyl phthalate	ND	ug/l	5.0				
Benzo(a)anthracene	ND	ug/l	5.0				
Benzo(a)pyrene	ND	ug/l	5.0				
Benzo(b)fluoranthene	ND	ug/l	5.0				
Benzo(k)fluoranthene	ND	ug/l	5.0				
Chrysene	ND	ug/l	5.0				
Acenaphthylene	ND	ug/l	5.0				
Anthracene	ND	ug/l	5.0				
Benzo(ghi)perylene	ND	ug/l	5.0				
Fluorene	ND	ug/l	5.0				
Phenanthrene	ND	ug/l	5.0				
Dibenzo(a,h)anthracene	ND	ug/l	5.0				
Indeno(1,2,3-cd)pyrene	ND	ug/l	7.0				
Pyrene	ND	ug/l	5.0				
Benzo(e)pyrene	ND	ug/l	5.0				
Biphenyl	ND	ug/l	5.0				

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH BLANK ANALYSIS**

Laboratory Job Number: L0600518

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE		ID
					PREP	ANAL	
Blank Analysis for sample(s) 01 (WG226714-1)							
SVOC's by GC/MS 8270 cont'd				1 8270C	0113 12:30	0116 18:27	RL
Perylene	ND	ug/l	5.0				
Aniline	ND	ug/l	10.				
4-Chloroaniline	ND	ug/l	5.0				
1-Methylnaphthalene	ND	ug/l	5.0				
2-Nitroaniline	ND	ug/l	5.0				
3-Nitroaniline	ND	ug/l	5.0				
4-Nitroaniline	ND	ug/l	7.0				
Dibenzofuran	ND	ug/l	5.0				
a,a-Dimethylphenethylamine	ND	ug/l	50.				
Hexachloropropene	ND	ug/l	10.				
Nitrosodi-n-butylamine	ND	ug/l	10.				
2-Methylnaphthalene	ND	ug/l	5.0				
1,2,4,5-Tetrachlorobenzene	ND	ug/l	20.				
Pentachlorobenzene	ND	ug/l	20.				
a-Naphthylamine	ND	ug/l	20.				
b-Naphthylamine	ND	ug/l	20.				
Phenacetin	ND	ug/l	10.				
Dimethoate	ND	ug/l	20.				
4-Aminobiphenyl	ND	ug/l	10.				
Pentachloronitrobenzene	ND	ug/l	10.				
Isodrin	ND	ug/l	10.				
p-Dimethylaminoazobenzene	ND	ug/l	10.				
Chlorobenzilate	ND	ug/l	20.				
3-Methylcholanthrene	ND	ug/l	20.				
Ethyl Methanesulfonate	ND	ug/l	15.				
Acetophenone	ND	ug/l	20.				
Nitrosodipiperidine	ND	ug/l	20.				
7,12-Dimethylbenz(a)anthracene	ND	ug/l	10.				
n-Nitrosodimethylamine	ND	ug/l	50.				
2,4,6-Trichlorophenol	ND	ug/l	5.0				
p-Chloro-m-cresol	ND	ug/l	5.0				
2-Chlorophenol	ND	ug/l	6.0				
2,4-Dichlorophenol	ND	ug/l	10.				
2,4-Dimethylphenol	ND	ug/l	10.				
2-Nitrophenol	ND	ug/l	20.				
4-Nitrophenol	ND	ug/l	10.				
2,4-Dinitrophenol	ND	ug/l	20.				
4,6-Dinitro-o-cresol	ND	ug/l	20.				
Pentachlorophenol	ND	ug/l	20.				
Phenol	ND	ug/l	7.0				
2-Methylphenol	ND	ug/l	6.0				
3-Methylphenol/4-Methylphenol	ND	ug/l	6.0				
2,4,5-Trichlorophenol	ND	ug/l	5.0				
2,6-Dichlorophenol	ND	ug/l	10.				
Benzoic Acid	ND	ug/l	50.				
Benzyl Alcohol	ND	ug/l	10.				

**ALPHA ANALYTICAL LABORATORIES**  
**QUALITY ASSURANCE BATCH BLANK ANALYSIS**

Laboratory Job Number: L0600518

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP      ANAL	ID
Blank Analysis for sample(s) 01 (WG226714-1)						
SVOC's by GC/MS 8270 cont'd				1 8270C	0113 12:30 0116 18:27 RL	
Carbazole	ND	ug/l	5.0			
Pyridine	ND	ug/l	50.			
2-Picoline	ND	ug/l	20.			
Pronamide	ND	ug/l	20.			
Methyl methanesulfonate	ND	ug/l	20.			
Surrogate(s)	Recovery		QC Criteria			
2-Fluorophenol	49.0	%	21-120			
Phenol-d6	40.0	%	10-120			
Nitrobenzene-d5	76.0	%	23-120			
2-Fluorobiphenyl	73.0	%	43-120			
2,4,6-Tribromophenol	88.0	%	10-120			
4-Terphenyl-d14	90.0	%	33-120			
Blank Analysis for sample(s) 01 (WG226715-1)						
PAH by GC/MS SIM 8270M				1 8270C-M	0113 12:30 0116 12:37 RL	
Acenaphthene	ND	ug/l	0.20			
2-Chloronaphthalene	ND	ug/l	0.20			
Fluoranthene	ND	ug/l	0.20			
Hexachlorobutadiene	ND	ug/l	0.50			
Naphthalene	ND	ug/l	0.20			
Benzo(a)anthracene	ND	ug/l	0.20			
Benzo(a)pyrene	ND	ug/l	0.20			
Benzo(b)fluoranthene	ND	ug/l	0.20			
Benzo(k)fluoranthene	ND	ug/l	0.20			
Chrysene	ND	ug/l	0.20			
Acenaphthylene	ND	ug/l	0.20			
Anthracene	ND	ug/l	0.20			
Benzo(ghi)perylene	ND	ug/l	0.20			
Fluorene	ND	ug/l	0.20			
Phenanthrene	ND	ug/l	0.20			
Dibenzo(a,h)anthracene	ND	ug/l	0.20			
Indeno(1,2,3-cd)Pyrene	ND	ug/l	0.20			
Pyrene	ND	ug/l	0.20			
1-Methylnaphthalene	ND	ug/l	0.20			
2-Methylnaphthalene	ND	ug/l	0.20			
Pentachlorophenol	ND	ug/l	0.80			
Hexachlorobenzene	ND	ug/l	0.80			
Perylene	ND	ug/l	0.20			
Biphenyl	ND	ug/l	0.20			
2,6-Dimethylnaphthalene	ND	ug/l	0.20			
1-Methylphenanthrene	ND	ug/l	0.20			
Benzo(e)Pyrene	ND	ug/l	0.20			
Hexachloroethane	ND	ug/l	0.80			

ALPHA ANALYTICAL LABORATORIES  
QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0600518

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP	DATE ANAL	ID
Blank Analysis for sample(s) 01 (WG226715-1)							
PAH by GC/MS SIM 8270M cont'd				1 8270C-M	0113 12:30	0116 12:37	RL
Surrogate(s)	Recovery			QC Criteria			
2-Fluorophenol	57.0	%		21-120			
Phenol-d6	46.0	%		10-120			
Nitrobenzene-d5	82.0	%		23-120			
2-Fluorobiphenyl	65.0	%		43-120			
2,4,6-Tribromophenol	69.0	%		10-120			
4-Terphenyl-d14	74.0	%		33-120			
Blank Analysis for sample(s) 01 (WG226718-1)							
Polychlorinated Biphenyls				5 608	0113 10:45	0117 01:10	SS
Aroclor 1221	ND	ug/l		0.250			
Aroclor 1232	ND	ug/l		0.250			
Aroclor 1242/1016	ND	ug/l		0.250			
Aroclor 1248	ND	ug/l		0.250			
Aroclor 1254	ND	ug/l		0.250			
Aroclor 1260	ND	ug/l		0.250			
Surrogate(s)	Recovery			QC Criteria			
2,4,5,6-Tetrachloro-m-xylene	60.0	%		30-150			
Decachlorobiphenyl	35.0	%		30-150			

**ALPHA ANALYTICAL LABORATORIES**  
**ADDENDUM I**

---

**REFERENCES**

1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.
3. Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
4. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised March 1983.
5. Methods for the Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A, Part 136, 40 CFR (Code of Federal Regulations).
19. Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
30. Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.
74. Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

**GLOSSARY OF TERMS AND SYMBOLS**

REF	Reference number in which test method may be found.
METHOD	Method number by which analysis was performed.
ID	Initials of the analyst.
ND	Not detected in comparison to the reported detection limit.
NI	Not Ignitable.
ug/cart	Micrograms per Cartridge.

**LIMITATION OF LIABILITIES**

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.



# CHAIN OF CUSTODY

PAGE \_\_\_\_ OF \_\_\_\_

Eight Walkup Drive Westborough, MA 01581  
TEL: 508-898-9220 FAX: 508-898-9193

## Client Information

Client: CAC

Address: 161 Accord PK Dr.

Morrellville MA

Phone: 781 792-2231

Fax:

Email:

☐ These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

## Project Information

Project Name: Tops Cleaners B

Project Location: Rahment, WA

Project #: 11-12

Project Manager: Mary G

ALPHA Quote #:

Turn-Around Time

☒ Standard

☐ RUSH (only confirmed if pre-approved)

Date Due: 1/19

Time:

Date Rec'd in Lab:

1/12

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☒ INDEX ☐ Add'l Deliverables

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

MA MDP/MDIS NPD35

MCP PRESUMPTIVE CERTAINTY - THESE QUESTIONS MUST BE ANSWERED

☐ Yes ☐ No Are MCP Analytical Methods Required?  
☐ Yes ☐ No Are Drinking Water Samples Submitted?  
☐ Yes ☐ No Have you met minimum field QC requirements?

ANALYSIS  
NPD35 Remit  
Total Metals  
TSS  
TRC, Hg, Cr  
8220  
PAH LOW  
TPH - 1664  
TCU  
Phenol  
PCB's

## SAMPLE HANDLING

☐ Filtration  
☐ Done  
☐ Not needed  
☐ Lab to do  
☐ Preservation  
☐ Lab to do  
(Please specify below)

## Sample Specific Comments

Substandard Parameters

Uids for 6244

SO4 forthcoming

to morrow

QUESTIONS ABOVE MUST BE ANSWERED FOR PRESUMPTIVE CERTAINTY

IS YOUR PROJECT MCP?

Relinquished By:

Date/Time

Received By:

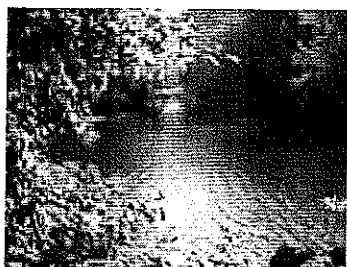
Date/Time

Container Type Preservative

☒

5cc bottles (unlabeled)

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.



## Friends of Alewife Reservation (FAR)

[FAR home page](#)

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[Events](#)   [News](#)   [Image Collections](#)  
[Archive & Links](#) (text, maps, photos)

[What we do](#) (Volunteer!)

[About FAR](#)

[Contact FAR](#)

Summary of Health Hazards in Cambridge and Belmont  
 Winter 2003, Little River - Alewife Brook subwatershed  
 Mark Kirk of FAR with information from the water quality testing team of the  
 Mystic River Watershed Association.  
 Mystic River Monitoring Network - Libby Larson: Coordinator

## Alewife Brook

### **Testing Sites:**

For baseline monitoring, samples are collected the second Wednesday of each month from the Somerville side of the Brook, just downstream of the Broadway Bridge. This site is referred to as **ALB006**.

For the samples collected from pipes, the following abbreviations were used:

<b>MBTA48</b>	48" Alewife 'T' outfall beside Yates Pond
<b>CAMD37</b>	Alewife Brook 'beginning' near 'T' marked CSO004
<b>ACORN1</b>	Pond East of Acorn Park Drive's West end
<b>HWY001</b>	Mass Highway drain by concrete post to ditch between Oliver Rd, Lake St
<b>CAMD38</b>	Huge round pipe on South end of open segment by Fawcett St.
<b>CAMD36</b>	Fawcett St rectangular drain to West side of open segment
<b>CAMD34</b>	Little Pond Conduit to Wellington Brook North of R/R tracks
<b>CAMD33</b>	Blanchard St drain (rectangle) at Wellington Brook
<b>BEL08S</b>	Center (round) outfall to Wellington Brook at Brighton/Blanchard
<b>BEL08N</b>	Northernmost (outside round) Wellington Brook @ Brighton/Blanchard
<b>BEL01x</b>	Brighton St drain to Little Pond between Pond St and Sandrick Rd.
<b>WEB013</b>	Wellington Brook @ Common Street
<b>WEB007</b>	Wellington Brook outfall to Claypit Pond
<b>WIB001</b>	Winn's Brook outfall to Little Pond
<b>SOMD11</b>	CSO SOM004 by pump station
<b>MDC86</b>	36" MDC #8(6) by Fairfax Street
<b>SOMD10</b>	12" clay aka MDC #6(6)
<b>SOMX01</b>	Clay pipe in square bulkhead
<b>ARL027</b>	Pipe with flap on end
<b>SOMD09</b>	CSO SOM002A/SOM003
<b>SOMD08</b>	CSO SOM002
<b>ARL026</b>	In front of gate in fence
<b>MDCX01</b>	MDC 'lost' drain in undercut in bank
<b>SOMD07</b>	Storm drain just downstream of Broadway
<b>ARL017</b>	Broadway main drain
<b>ARLX02</b>	Smaller Broadway drain under bridge near upstream end
<b>SOMD05</b>	2nd pipe downstream of Henderson
<b>ARL014</b>	First drain upstream of Henderson

<b>ARL013</b>	2nd drain upstream of Henderson
<b>ARL011</b>	Mass Avenue Drain in abutment
<b>ALB013</b>	Alewife Brook centerline downstream of Rt 2
<b>ADL001</b>	ADL office park drain
<b>ADL001</b>	ADL office park drain DUP
<b>MARSH1</b>	Outflow from 'Martignetti Marsh'
<b>WEB001</b>	Wellington Brook mouth @ Perch Pond
<b>BEL013</b>	Spy Pond Conduit
<b>BEL011</b>	Drain to NW corner of Little Pond

For centerline sampling, the last 3 digits of the site ID indicate the location of the site in river miles from the mouth, e.g. ALB006 is 0.6 miles from the mouth at the Mystic River.

### Results (Summary):

All of the waters tested have been classified as Class B waters—meaning that the water should meet fishable and swimmable standards. The Massachusetts Surface Water Quality Standards (MASWQS, 314 CMR 4.00) for primary and secondary contact are 200 cfu/100ml and 1,000 cfu/100ml, respectively, of fecal coliform from a single sample.

For the June 2002 sampling event, again four out of twenty-seven samples met the MASWQS for swimming, with the same three Little River samples coming up "clean." None of the samples violated the criteria for boating. The geometric mean for this event was 296 cfu/100 ml. Rainfall prior to the event was 0 inches, except 0.07 inches was recorded two days before the event.

*Pipes monitoring* – Most of the pipes sampled in April 2002 were clean, however there are several exceptions to note: MBTA48, HWY001, WEB013, MDCX01, SOMD07, ARL014, ARL013, MARSH1, BEL013, BEL011 (with exceptionally high results above 100,000 cfu/100 ml), and WIB001. There was only trace rainfall in the three days prior to this event. Repeated sampling of select pipes in June 2002 showed reduced levels at both ARL014 and ARL013, and increased levels at BEL013, BEL011, and WIB001. BEL011 had results greater than 200,000 cfu/100 ml.

### Conclusion:

It is quite striking that during dry weather, the centerline results for Alewife Brook have consistently across time and space come up relatively "clean," despite some very large inputs from area pipes. The high inputs into Little Pond clearly settle out so that the Little River water is very clean. Following the Brook downstream, however, inputs from Wellington Brook again raise the bacteria levels, which then generally decline as the Brook flows to the Mystic, although there is some elevation in the ALB009 - ALB015 range.

The variation seen in the "Alewife Brook Centerline Fecal Coliform Results" could be due to the poor precision of bacteria analysis methods alone (i.e. culturing bacteria from the same sample bottle often yields results that differ widely but are the same order of magnitude). The results are all in the same order of magnitude and the graph could be considered essentially flat line. Eliminating these large point sources and improving the flow conditions of the Alewife could potentially lead to the development of a dry-weather TMDL for Alewife well within the limits of the MASWQS for Class B waters.

Baseline monitoring at ALB006 revealed that the Brook violates both the primary and secondary standards for Class B waters, especially during rain events. In October 2002 we completed some wet-weather sampling of select pipes along the Brook, although we have not yet received the results from the Lab. We hope to do more in the future as weather and resources permit, in order to evaluate the impact of wet weather pipes and non-point sources on the system.

## **Wellington Brook**

### **Testing Sites:**

<b>WEB022</b>	Belmont source for Junction Brook at 170' elevation off Pleasant Street @ McLean.
<b>WEB020</b>	Belmont's Junction Brook by Pleasant Street at 80' elevation. Just before it goes underground to join Wellington Brook.
<b>WEB013</b>	Belmont where Wellington Brook emerges from under Common Street to run behind the Library.
<b>WEB010</b>	Belmont behind East end of Library where brook goes back underground next to the pool and low area used for skating.
<b>WEB007</b>	Belmont by Concord Avenue where Wellington Brook flows into the SW corner of Claypit Pond.
<b>WEB005</b>	Belmont in the NE corner of Claypit Pond by outlet.
<b>WEB003</b>	Belmont where Wellington emerges from beneath Brighton Street before it mixes with Cambridge drain to enter Blair Pond.
<b>WEB002</b>	Cambridge Blair Pond outlet North just before R/R. This shows both the addition of the Cambridge drain at Blanchard Street, and some settling of contaminants in the pond.
<b>WEB001</b>	Cambridge before Perch Pond (end of Wellington Brook) but after the last stormdrain mixes in from Normandy Terrace and Blacks Nook.

### **Results (summary):**

All of the waters tested have been classified as Class B waters, meaning that the water should meet fishable and swimmable standards. For fecal coliform, all but two of the results violated the Massachusetts Surface Water Quality Standards (314 CMR 4.00) for primary and secondary contact. The two sites which met primary contact standards were Belmont in the NE corner of Claypit Pond (WEB005), and Junction Brook at Pleasant Street (WEB020). The highest result for fecal coliform (65,000 cfu/100 mL) was at WEB013, Wellington Brook behind the library.

Two sampling locations had dissolved oxygen (DO) results below one of the criteria established by the state. Wellington Brook in Cambridge before Perch Pond (WEB001), and Wellington Brook in Cambridge at Blair Pond (WEB002) both had percent saturation readings below the MASQWS standard of 60%.

### **Conclusion:**

The high levels of fecal coliform and E. coli bacteria are of concern for public health, especially because many of the sampling locations have easy public access. The two locations nearest the Library have the easiest and most frequent public use. However, during these winter months the potential for public contact is reduced. Due to the very high results at several locations (particularly the location behind the Library), we hypothesize that sewage is contaminating the Brook at points currently culverted. Additional bracket sampling would be required via manholes to determine precise locations. The Mystic River Watershed Association would be happy to assist the town of Belmont in any further sampling and investigation.

## **Winn's Brook**

### **Testing Sites:**

<b>WIB001</b>	Winn's Brook outfall to Little Pond
<b>WIB003</b>	Grate over Brook East side of Waterhouse Road
<b>WIB005</b>	Grate over Brook North side of Sherman Street
<b>WIBUTA</b>	Grate over Tributary 'A' @ 32 Frost Street
<b>WIB009</b>	Brook beside 73 Claflin Street upstream of grate
<b>WIB012</b>	Brook East side of Clifton Street by Hickory Lane
<b>WIB013</b>	Brook at Howells Road footpath bridge
<b>WIBUTB</b>	Tributary 'B' South side of Pleasant West of Clifton St
<b>ATB004</b>	Atkins Brook by wetland pond in Audubon Sanctuary

### **Results**

For the baseline monitoring, the geometric mean for WIB001 is 844 cfu/100 ml for the period 7/2000 – 5/2002. For these samples, 75% violated the standard for primary contact, and 46% violated the standard for secondary contact.

For the March 26<sup>th</sup> monitoring, 4 samples violated the primary contact standard, and only 2 violated the secondary contact standard. The two violations occurred at WIB001 and WIB005 (Grate over Brook North side of Sherman Street).

One sampling location had dissolved oxygen (DO) results below one of the criteria established by the state. Atkin's Brook had a percent saturation of 58.3%, just below the state standard of 60%. This is probably due to the effect of the nearby wetland on the Brook.

While there are no state standards for salinity, salinity can be an indicator of probable contamination. For the March 26<sup>th</sup> sampling, salinity ranged from 0.2 ppt at Tributary A (WIBUTA) to 0.6 ppt at Tributary B (WIBUTB) and WIB003.

### **Conclusion**

The high levels of fecal coliform and E. coli bacteria are of concern for public health, especially because Winn's Brook discharges into Little Pond, which is used recreationally. Atkins Brook and upstream sections of Winn's Brook are very clean. Due to the higher concentrations of fecal coliform downstream at WIB001 and WIB005, we hypothesize that sewage is contaminating the Brook at points currently culverted. Additional bracket sampling would be required via manholes to determine precise locations. The Mystic River Watershed Association would be happy to assist the town of Belmont in any further sampling and investigation.

**BEST MANAGEMENT  
PRACTICES PLAN**

**COMMON STREET TRUST BUILDING  
102-104 TRAPELO  
BELMONT, MASSACHUSETTS**

**RTN 3-23300**

**January 13, 2009**

*Prepared for:*

**Mr. Chris Starr  
Jenkins/Starr LLC  
6 Littlefield Road  
Acton, Massachusetts 01720**

*Prepared by:*



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*Jake Hurley  
Project Scientist*

*Reviewed by:*



---

*Glen A. Cote  
Project Manager*

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101 Accord Park Drive  
Norwell, Massachusetts 02061-1685  
(781)-982-5400**

**Project No. 11-1226.00**

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Common Street Trust Building  
102-104 Trapelo Road  
Belmont, Massachusetts  
RTN 3-23300

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<b>3.0</b>	<b>POLLUTION CONTROLS .....</b>	<b>1</b>
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**FIGURES**

Figure 1	Site Plan
Figure 2	Pump & Treat Diagram

**APPENDIX**

Appendix A	Health and Safety Plan
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## 1.0 INTRODUCTION

On behalf of Jenkins/Starr LLC, Coler & Colantonio Inc. has prepared this *Best Management Practices Plan (BMPP)* for the discharge operations covered under the Remedial General Permit (RGP) submitted to the United States Environmental Protection Agency (EPA) in December, 2008 for groundwater discharge associated with the remediation of contaminated groundwater occurring at the Common Street Trust (CST) Building located at 102-104 Trapelo Road in Belmont, Massachusetts (the "Site"). The discharge is expected to occur until December 2010. A copy of the BMPP will be maintained on-Site and will be made available for inspection to federal and state personnel.

## 2.0 SYSTEM DESCRIPTION

The basement of the CST building has been utilizing a submersible (sump) pump system to control surface water and groundwater that periodically floods the basement. In 2006, it was determined that the groundwater infiltrating the basement had detectable concentrations of contamination. Therefore, Coler & Colantonio, Inc. determined that by modifying the sump system to a Pump & Treat (P&T) system that the water in the basement can continued to be controlled via the existing sumps and the contaminants can be treated prior to discharge to the storm drain.

The P&T system consists of three sump pumps manifolded together prior to treatment via granular activated carbon (GAC) with activated carbon/zeolite impregnated with potassium iodide ( a.k.a, "coconut carbon") that discharges to the storm drain that is located outside of the southwest corner of the building. The P&T system operates via three float controlled sump pumps that are active based on water/groundwater infiltration. The groundwater collected from the three sumps is pumped to the active system, consisting of a 55-gallon receiving drum with a sump for controlling flow rate, which is then transferred to another 55-gallon drum with coconut carbon. The groundwater passes through the coconut carbon drum, which decreases the concentrations of chlorinated solvents, MtBE, cyanide, and lead before being discharged into the catch basin behind the CST Building. The system's discharge is not anticipated to be greater than 7 gallons per minute (gpm) and the P&T system designed flow rate can process up to 10 gpm. An inline water flow meter tracks the volume of groundwater processed.

## 3.0 POLLUTION CONTROLS

Several controls have been included in the remedial design to minimize the possibility of an accidental discharge or spill and to minimize the impacts should an accidental discharge or spill occur. Drums have been elevated above the basement floor to eliminate contact with the water on the basement floor, thus preventing corrosion caused by flooding when the water table rises. The P&T system will be monitored once a month by a licensed wastewater operator to insure that the P&T System is operating properly and compliant with the

applicable regulations. Monthly samples will be collected at both the influent and effluent stages of the system to ensure the target contaminants are not breaking through the treatment process (see below for additional details). Spent coconut carbon drums will be disposed of Uniform Hazardous Waste Manifest and Bill of Lading (BOL).

#### **4.0 MONITORING ACTIVITIES**

Monthly monitoring activities will be conducted by Coler & Colantonio, Inc. to ensure that the P&T System is maintaining compliance with the RGP. Based on previous sampling data, the chemicals of concern are volatile organic compounds (VOCs), lead, and total cyanide. Upon approval of the RGP, Coler & Colantonio will collect influent and effluent samples from the system on the first, third, and sixth day of discharge (if feasible with the intermittent discharge of the system); weekly for the first month; and then monthly. Samples will be analyzed for all compounds detected in the pre-remediation RGP parameter analysis and samples collected within the first week will be submitted for 72 hour analysis. The P&T will be immediately shutdown upon any indication of malfunction or violation of effluent limitations. In accordance with the RGP, a summary of the results will be submitted to the United State Environmental Protection Agency (EPA) Northeast (NE) office and the DEP Northeast Regional Office (NERO) if a violation of the effluent limits occurs.

Monthly samples will be collected at both the influent and effluent stages of the system to ensure the target contaminants are not breaking through the treatment process. Samples will be analyzed for all compounds detected in the pre-remediation RGP parameter analysis, including VOCs via EPA 524 Method, dissolved lead, and total cyanide. The system will be immediately shut down upon any indication of malfunction or violation of effluent limitations. In accordance with the RGP, a summary of the results will be submitted to the EPA-NE office and the DEP NERO if a violation of the effluent limits occurs, in addition to the RMRs that are submitted. The water level meter will be utilized to obtain the total monthly volume of groundwater discharged.

#### **5.0 PREVENTATIVE MAINTENANCE PLAN**

The P&T System has been operating efficiently over the past year and the monthly inspections have reduced any maintenance problems to a minimum. The system is streamline, and minimal prevention controls are necessary. Coler & Colantonio have utilized ground-fault intercepts to avoid electricity issues and elevated the drums to avoid potential rusting. If the system is compromised, Coler & Colantonio will immediately perform the necessary repairs or adjustments to resolve the issue.

## **6.0 EMPLOYEE TRAINING**

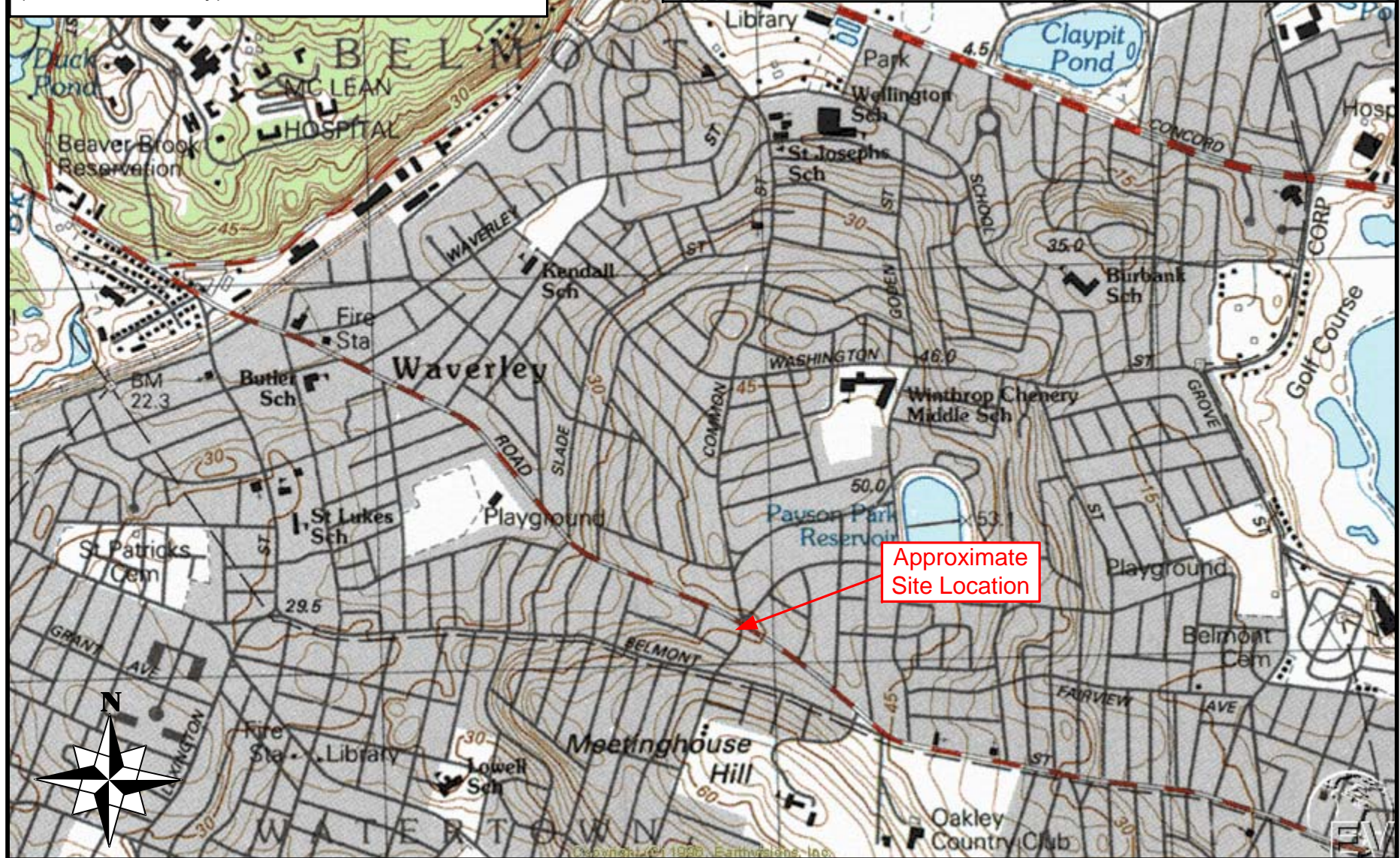
Any employee who has direct or indirect responsibility for ensuring compliance with the RGP will be instructed in the requirements of the RGP. Employees will be made aware of the compounds which must be monitored, the appropriate laboratory methods for these compounds, and the appropriate sampling techniques and frequency required to maintain compliance with the RGP. Employees will be provided with a written description of the P&T System, as well as a flow diagram of the system, and will be instructed on the individual stages of the system and the proper maintenance of the system. Employees will be instructed on the proper monitoring procedures and frequency and will be provided with the appropriate monitoring forms. In addition, employees will be provided with the phone number of at least one emergency contact familiar with the P&T system and the requirement of the RGP. A Health and Safety Plan (HASP) has been prepared and is attached.

## FIGURES

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Figure 1	Site Plan
Figure 2	Pump & Treat Diagram

From: USGS Boston North, Massachusetts  
Topographic Quadrangle  
(Middlesex County)



REVISIONS:	
No.	DATE

GENERAL NOTES:

Plan based on Belmont Assessor maps, Figure No. 6-1 prepared by GeoSyntec Consultants of Acton, MA and prepared on 10/14/2004, field measurements collected by C&C, and utilities marked-out at the Site.

COLER & COLANTONIO & ENGINEERS AND SCIENTISTS

781-882-5400 Fax: 817-582-5490 101 Accord Park Drive Norwell, MA 02061-1655

TITLE:

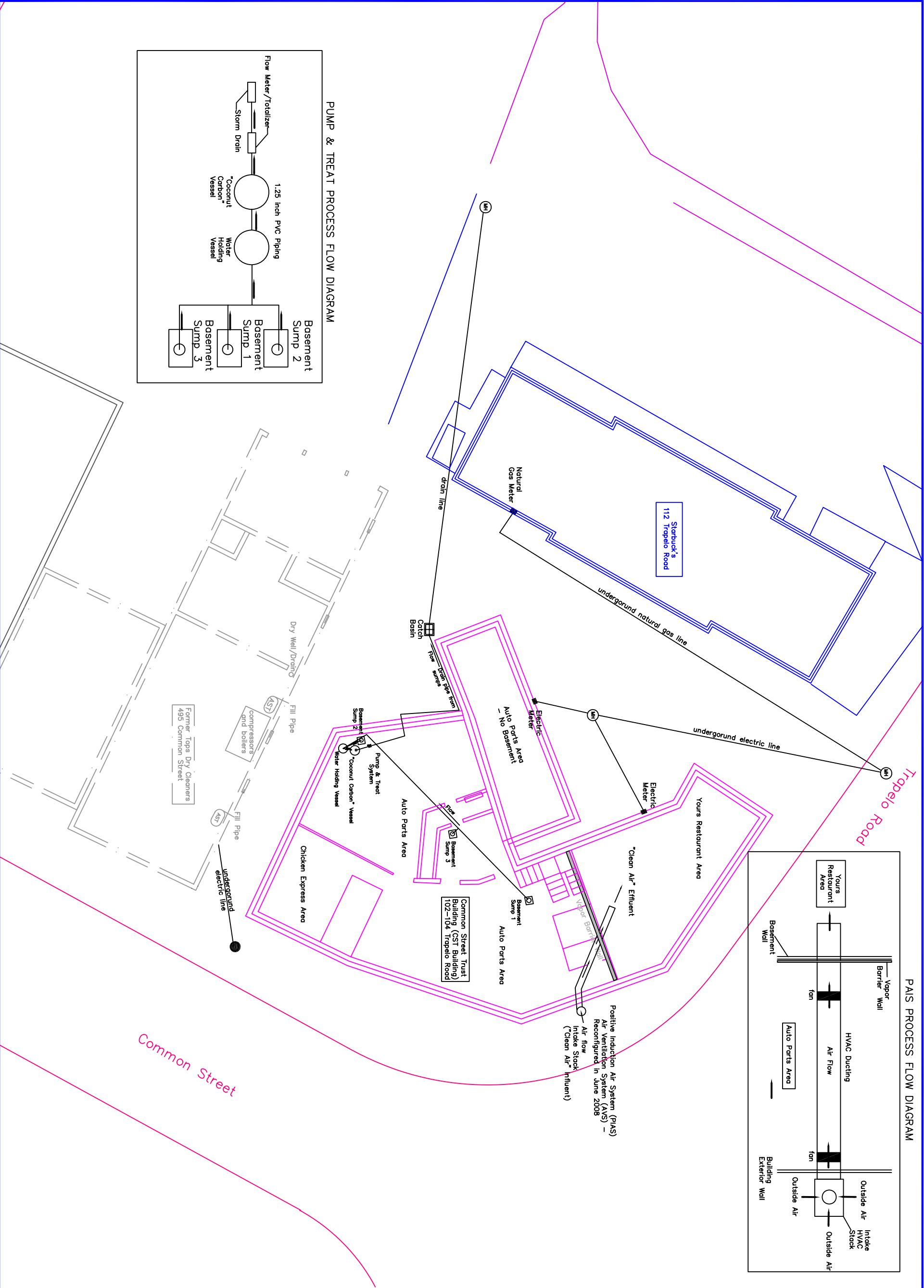
FIGURE 1 – Process Flow Diagram

Pump and Treat System and the Positive Air Induction System

PREPARED FOR:

TOPS CLEANERS  
495 COMMON STREET  
BELMONT, MA 02478

DATE:	NOVEMBER 11, 2008
COMP./DESIGN:	GAC
CHECK:	RKB
DRAWN:	MLR
SCALE:	1" = 20'
hyperfile:	\\na001\endoclient\PROJECTS\DMT\11-1200\11-1208_topa
	Figure 2-NOV 08.dwg
DWG NO.:FIG. 2	SHEET: 1 OF 1



## APPENDIX

---



## HEALTH & SAFETY PLAN

**Important: Please forward one copy of completed document to the reviewer three (3) working days prior to project start up and maintain a copy on site. Place signed copy in project file. Items marked with "1910.120..." are required by 29 CFR 1910.120 in the paragraph noted.**

### A. GENERAL INFORMATION (1910.120(c)(4))

Project Name Common Street Trust (CST) Building Project Number 11-1226.00

RTNs 3-23300

Project Manager Glen Cote  
Print Signature

Site or Building Name Common Street Trust (CST) Building – (Former Tops Cleaners Release)

Address 102-104 Trapelo Road

City, State & Zip Belmont, MA

Coler & Colantonio, Inc. Safety & Health Supervisor Name Ronald Burns

Coler & Colantonio, Inc. Safety & Health Supervisor Phone Number (781) 792-2230

Client Contact Name Chris Starr

Client Contact Phone Number (978) 502-2276

Fire #: 911 Police #: 911 Ambulance #: 911

Nearest Hospital Name Mount Auburn Hospital (approximately 8 mins drive time)

Phone (617) 499-5025

Address 330 Mt. Auburn Street, Cambridge, MA

Directions to Hospital 1. Head northeast on Common St. towards Trapelo Rd. (207 ft.)

(see attached map) 2. Turn right at Trapelo Rd. (0.2 mi)

3. Make a slight left at Belmont St. (1.1 mi)

4. Turn left at Mt. Auburn St./RT-16 and continue to follow for 0.3 mi.

5. Turn left at Brattle St. (66 ft.)

6. Turn right to stay on Brattle St. (0.4 mi)

7. Turn right at Channing St. (0.1 mi)

8. Turn left at Mt. Auburn St. (279 ft)

9. Arrive at hospital on right.

Location of Nearest Phone Inside CST building; cell phone  
(and special dialing instructions if any)

Directions for Emergency Escape Head southwest on Common St. for 66 ft. then turn right at Horne Rd.

Turn right onto Williston Rd. and travel for 184 ft.

---

Designated Reporting Area      Parking Lot at 36 Williston Road  
(after emergency occurrence)

---

**B. SITE DESCRIPTION (1910.120(c)(4))**

**Facility History:**

Commercial and Retail Property - Former Dry Cleaning Operations abuts the property

---

**Type of Hazard Anticipated On Site (i.e. tanks, drums, etc.):**

Contaminated air, soil and groundwater.

---

**Amount of Hazardous Materials Present:**

The area containing soils and groundwater with contaminant concentrations exceeding applicable MCP

---

Method 1 Cleanup Standards exists beneath the former Tops Dry Cleaner building, the common alleyway, and the extreme southern portion of the Starbucks property and portions of the Common Street Trust (CST) building to the northeast.

---

**Water Supply:**

First Floor and Basement of CST building

---

**General Site Description (including topography, accessibility, & site size):**

The Site is located on a 6,400 sf commercial property. Access to the property is from Common St. thorough alley way and Trapelo Rd through alley way.

---

Flat topography.

---

See attached Site map

---

**C. PROJECT OBJECTIVE(S) (1910.120(b)(3))**

**(Description of work area activities planned:)**

Gauging and sampling of monitoring wells as well as soil gas monitoring will be conducted at the Site.

---

Maintaining Pump and Treat System in basement of CST building.

---

**Estimated Duration of Activities:**      May 2005-December 2010

---

**D. PROJECT ORGANIZATION (1910.120(b)(2))**

<u>Team Member</u>	<u>Responsibility</u>	<u>Type of Training</u>	<u>Date of Training</u>
Ronald Burns	<b>Safety &amp; Health Supervisor</b>	C & D	3/15/08
William R. Hoyerman	<b>General Supervisor</b>	C & D	3/15/08
Glen Cote	General Supervisor/Site Worker	A & D	3/15/08
Jake Hurley	General Site Worker	A & D	

**Training Codes:**

- A – minimum of 40 hours of instruction off the site & a minimum of 3 days field experience under the direct supervision of a trained experienced supervisor (*appropriate for general site workers such as equipment operators, general laborers & supervisory personnel engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards*)
- B – minimum of 24 hours of instruction off the site & a minimum of 1 day field experience under the direct supervision of a trained experienced supervisor (*appropriate for workers on site only occasionally for a specific limited task such as groundwater monitoring, land surveying, or geophysical surveying & who are unlikely to be exposed over permissible & published exposure limits or workers regularly on site who work in areas which have been monitored & fully characterized indicating that exposures are under permissible & published exposure limits, where respirators are not necessary, & the characterization indicates that there are no health hazards or the possibility of an emergency developing*)
- C – minimum of 40 hours of instruction off the site & a minimum of 3 days field experience under the direct supervision of a trained experienced supervisor and at least 8 additional hours of specialized training on such topics as the employer's safety & health program, PPE program, spill containment program, & health hazard monitoring procedure and techniques (*appropriate for on-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations*)
- D – 8 hours of annual refresher training (*appropriate for general site workers such as equipment operators, general laborers & supervisory personnel engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards & on-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations*)
- E – equivalent training (*includes any academic training or the training that employees might have had from actual hazardous waste site experience*)

<b>Responsibility</b>	<b>Description</b>
Safety & Health Supervisor	Responsible for the implementation of the site health & safety plan & verify compliance with applicable safety & health requirements. May also conduct remediation oversight, sample collection, and field monitoring.
General Supervisor	Directs all hazardous waste operations. May also conduct remediation oversight, sample collection, and field monitoring.
General Site Worker	Conducts remediation oversight, sample collection, and field monitoring.

**E. CHEMICAL HAZARD ANALYSIS (1910.120(b)(4))**

Contaminant	IP	PEL/TLV	IDLH	LEL/UEL	Flash Point	Routes of Exposure
Tetrachloroethylene		100 ppm/25 ppm			Not flammable	Absorption, inhalation, ingestion
Trichloroethylene						
cis-1,2-dichloroethene		N/A		9.70%/12.8%	42.80°F	Absorption, inhalation, ingestion
Vinyl chloride		1 ppm/5 ppm		3.6% (LEL)	-108°F	Absorption, inhalation, ingestion
1,1-dichloroethene		100 ppm			1.4 °F	Absorption, inhalation, ingestion

NOTE: Attach Material Safety Data Sheets for all substances identified above. Also see Section (M) (2).

**F. OTHER HAZARDS**

Heat Stress? ☒ Yes ☐ No If yes, please specify precautions to be taken:

Suitable clothing which adequately ventilates must be worn. Drink a suitable amount of fluids.

If necessary, rest in a cool, shaded location.

Cold Stress? ☒ Yes ☐ No If yes, please specify precautions to be taken:

Suitable clothing which adequately insulates must be worn at all times, this includes a hat and

Gloves. If necessary, warm up in a vehicle or nearby building.

Excessive Noise? ☐ Yes ☒ No If yes, please specify precautions to be taken:

Confined Space Entry? ☐ Yes ☒ No If yes, attach copy of Confined Space Entry Permit.

Excavations 4' or greater in depth? ☐ Yes ☒ No If yes, specify precautions to be taken:

Welding, Cutting & Brazing? ☐ Yes ☒ No If yes, specify precautions to be taken:

Heavy Equipment Operation? ☐ Yes ☒ No If yes, specify precautions to be taken:

Slip, Trip or Fall Hazards? ☒ Yes ☐ No If yes, specify precautions to be taken:

Properly store equipment when not in use. Be aware of scattered debris throughout the Site.

#### Presence of Overhead Utilities

Are overhead utilities present at the project site? ☒ Yes ☐ No

**\*If so, always maintain suitable clearance from overhead lines.**

Specify location: \_\_\_\_\_

#### Presence of Underground Utilities

Have underground utilities been located and marked at the site? ☒ Yes ☐ No ☐ NA

Specify names and phone number of utilities contact:

Name of Contact Dig Safe

Phone Number 1-888-344-7233

### **G. SITE CONTROL (1910.120(d))**

**Work Zones** have been established as shown on the attached **Site Plan**.

Site Security: Security on site will be maintained by:

\_\_\_\_\_ Temporary barricades and/or warning tape

X Security Fencing – parking lot is fenced-in.

\_\_\_\_\_ 24 Hour Security

X Other (specify) Asphalt, secure well caps

### **H. PERSONAL PROTECTIVE EQUIPMENT (1910.120(b)(4)) (LIST EXPOSURES UNDER WORK ZONE)**

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work zones:

<u>Work Zone</u>	<u>Level of Protection</u>	<u>Required Protective Equipment</u> (specify exact type e.g. nitrile gloves)
Exclusion Zone	<u>D</u>	Respirator: _____ Filters/Cartridges: _____ Boots: <u>Chemical resistant</u> Inner Gloves: _____

	Outer Gloves:	<u>Nitrile</u>
	Protective Coverall:	<u>Work uniform</u>
	Hard Hat:	<u></u>
	Eye Protection:	<u>Safety Glasses</u>
	Ear Protection:	<u></u>
	Other:	<u></u>
Contamination	<u>D</u>	Respirator:
Reduction Zone		Filters/Cartridges:
		Boots:
		<u>Chemical resistant</u>
		Inner Gloves:
		Outer Gloves:
		<u>nitrile</u>
		Protective Coverall:
		<u>Work uniform</u>
		Hard Hat:
		Eye Protection:
		Ear Protection::
		Other:
Exceptions and Modifications:		
<u></u>		
<u></u>		
<u></u>		

## I. DECONTAMINATION (1910.120(k))

### Personnel Decontamination Procedures

All personnel entering the Exclusion Zone will undergo decontamination prior to leaving the Site. Personnel will proceed through the following decontamination stations:

Decontamination Solution: Alconox and water

STATION #1: Scrub all reusable equipment thoroughly with decontamination solution.

Equipment Required: Decontamination solution, clean brush or rag

STATION #2: Rinse and dry all reusable equipment

---

## Gross Removal By:

**Y**

---

Cold High Pressure Wash

Hot High Pressure Wash

---

Steam Cleaning

Other (specify) \_\_\_\_\_

X	Clean Rinse
---	-------------

X	Decon solution (specify)	Alconox & water
---	--------------------------	-----------------

---

---

---

---

<u>Activity &amp; Contaminant</u>	<u>Instruments</u>	<u>Action Level</u>	<u>Frequency</u>
Indoor air (if noted)	PID	10 ppmv at breathing zone	15 minutes or longer

---

Comments: If action level is observed, secure source (if known), ventilate area, and vacate until  
levels subside or additional PPE can be acquired.

**K. PERSONNEL AIR MONITORING (1910.120(h))**

<u>Activity/Location</u>	<u>Contaminants(s)</u>	<u>NIOSH/OSHA Protocol</u>
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

**L. CONTINGENCY PLAN (1910.120(l))**

Emergency Communication Signal(s) (specify): 

---

Emergency Escape Route(s) (specify and indicate on site diagram): Head southwest on Common St.  
for 66 ft. then turn right at Horne Rd. Turn right onto Williston Rd. and travel for 184 ft. to the parking lot  
At 36 Williston Rd.

Emergency Equipment On Site: (specify location):

First Aid Kit: In Company Vehicle

Fire Extinguishers: In Company Vehicle

Telephone: Cell phone

Water Supply: Inside the CST building in bathrooms

Eye Wash/Safety Shower: Use water supply in bathrooms

Others (specify): 

---

Re-entry to the Exclusion Zone following an on-site emergency shall not be permitted until the following conditions are satisfied:

- (1) The conditions resulting in an emergency have been corrected.
- (2) The hazards have been re-evaluated.
- (3) The HASP has been reviewed and determined adequate for the hazards encountered.
- (4) All site personnel have been instructed in any new hazards and changes to the HASP.

## **N. ATTACHMENTS**

The following items have been amended to this Health & Safety Plan:

- 1) Hospital Map
- 2) Site Plan
- 3) Emergency Phone Numbers List
- 4) HASP Review List
- 5) MSDS

**\*\* EMERGENCY PHONE NUMBERS \*\***

---- Post in Full View ----

Coler & Colantonio, Inc. Safety & Health Supervisor ..... (781) 982-5400 x 230

Chemtrec..... (800) 424-9300

DOT Hotline..... (202) 366-4488  
Materials Transportation Bureau

Centers for Disease Control and Prevention..... (404) 633-5313  
(Emergency Only)

Solid Waste and Emergency Response..... (202) 260-2180  
Office of Emergency and Remedial Response

TSCA Assistance Information Services Hotline ..... (202) 554-1404

**HOSPITAL:**

(Name): Mount Auburn Hospital

(Address): 330 Mt. Auburn Street, Cambridge, MA

(Phone): (617) 499-5025

(Travel Time): 8 minutes

(Directions to Hospital) 1. Head northeast on Common St. towards Trapelo Rd. (207 ft.)  
(see attached map) 2. Turn right at Trapelo Rd. (0.2 mi)  
3. Make a slight left at Belmont St. (1.1 mi)  
4. Turn left at Mt. Auburn St./RT-16 and continue to follow for 0.3 mi.  
5. Turn left at Brattle St. (66 ft.)  
6. Turn right to stay on Brattle St. (0.4 mi)  
7. Turn right at Channing St. (0.1 mi)  
8. Turn left at Mt. Auburn St. (279 ft)  
9. Arrive at hospital on right.

**PARAMEDICS:**

(Name): Belmont Emergency Medical Services

(Phone): 911

**FIRE DEPT:**

(Name): Belmont Fire Department

(Phone): 911

**LOCAL POLICE:**

(Name): Belmont Police Department

(Phone): 911

**UTILITIES:**

(Electric): \_\_\_\_\_

(Gas): \_\_\_\_\_

All personnel have read the HASP and are familiar with its provisions. All personnel have received training in compliance with the Coler & Colantonio, Inc.'s Health and Safety Policy.

[illegible]





Start **495 Common St  
Belmont, MA 02478**

End **Mount Auburn Hospital  
330 Mount Auburn St, Cambridge, MA  
02138**

Travel **2.3 mi – about 8 mins**

Get Google Maps on your phone

Text the word "GMAPS" to 466453



**495 Common St  
Belmont, MA 02478**

Drive: 2.3 mi – about 8 mins

- |   |                  |
|---|------------------|
| 1. Head <b>northeast</b> on <b>Common St</b> toward <b>Trapelo Rd</b>                 | 207 ft           |
| ➔ 2. Turn <b>right</b> at <b>Trapelo Rd</b>   | 0.2 mi<br>1 min  |
| ⬅ 3. Slight <b>left</b> at <b>Belmont St</b>  | 1.1 mi<br>3 mins |
| ⬅ 4. Turn <b>left</b> at <b>Mt Auburn St/RT-16</b><br>Continue to follow Mt Auburn St | 0.3 mi<br>1 min  |
| ⬅ 5. Turn <b>left</b> at <b>Brattle St</b>  | 66 ft            |
| ➔ 6. Turn <b>right</b> to stay on <b>Brattle St</b>                                   | 0.4 mi<br>2 mins |
| ➔ 7. Turn <b>right</b> at <b>Channing St</b>  | 0.1 mi           |
| ⬅ 8. Turn <b>left</b> at <b>Mt Auburn St</b>  | 279 ft           |

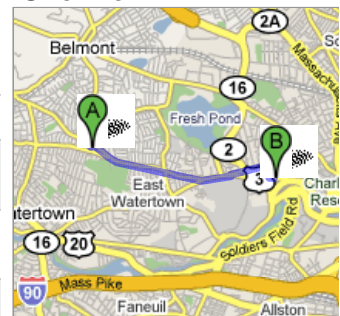


**Mount Auburn Hospital  
330 Mount Auburn St, Cambridge, MA 02138**

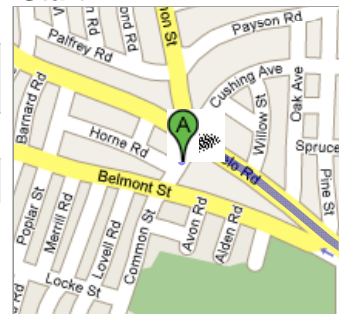
These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Map data ©2008 NAVTEQ™

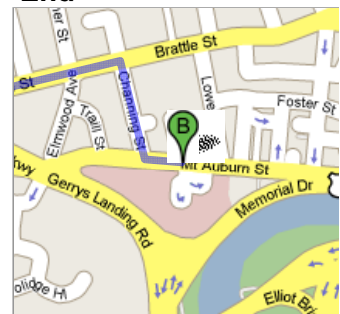
### Overview



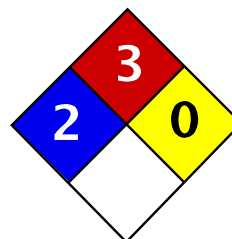
### Start



### End



Map data ©2008 NAVTEQ™



Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet

### 1,1-Dichloroethane MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** 1,1-Dichloroethane

**Catalog Codes:** SLD3280

**CAS#:** 75-34-3

**RTECS:** KI0175000

**TSCA:** TSCA 8(b) inventory: 1,1-Dichloroethane

**CI#:** Not available.

**Synonym:**

**Chemical Name:** 1,1-Dichloroethane

**Chemical Formula:** C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**  
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{1,1-}Dichloroethane	75-34-3	100

**Toxicological Data on Ingredients:** 1,1-Dichloroethane: ORAL (LD50): Acute: 725 mg/kg [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:** Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

**CARCINOGENIC EFFECTS:** Classified 2 (Reasonably anticipated.) by NTP. A4 (Not classifiable for human or animal.) by ACGIH.

**MUTAGENIC EFFECTS:** Not available.

**TERATOGENIC EFFECTS:** Not available.

**DEVELOPMENTAL TOXICITY:** Classified Development toxin [POSSIBLE].

The substance is toxic to kidneys, lungs, liver, central nervous system (CNS).

Repeated or prolonged exposure to the substance can produce target organs damage.

#### Section 4: First Aid Measures

**Eye Contact:** Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 458°C (856.4°F)

**Flash Points:** CLOSED CUP: -17°C (1.4°F). OPEN CUP: -6°C (21.2°F).

**Flammable Limits:** LOWER: 5.6% UPPER: 11.4%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>), halogenated compounds.

**Fire Hazards in Presence of Various Substances:** Not available.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid.

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Flammable liquid.

Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth,

sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents, alkalis.

### Storage:

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 100 STEL: 250 (ppm) from ACGIH (TLV) [1999]

TWA: 100 (ppm) from OSHA (PEL)

Australia: TWA: 200 (ppm)

Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Oily liquid.)

**Odor:** Chloroform like odor (Slight.)

**Taste:** Not available.

**Molecular Weight:** 98.96 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 57.3°C (135.1°F)

**Melting Point:** -96.9°C (-142.4°F)

**Critical Temperature:** 261.5°C (502.7°F)

**Specific Gravity:** 1.175 (Water = 1)

**Vapor Pressure:** 180 mm of Hg (@ 20°C)

**Vapor Density:** 3.44 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 120 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:**

Partially dispersed in diethyl ether.

See solubility in water, diethyl ether.

**Solubility:** Partially soluble in diethyl ether.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Reactive with oxidizing agents, alkalis.

**Corrosivity:** Corrosive in presence of aluminum.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Will attack some forms of plastic and rubber

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD50): 725 mg/kg [Rat].

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified 2 (Reasonably anticipated.) by NTP. A4 (Not classifiable for human or animal.) by ACGIH.

DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE].

The substance is toxic to kidneys, lungs, liver, central nervous system (CNS).

**Other Toxic Effects on Humans:** Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are as toxic as the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:**

CLASS 3: Combustible liquid with a flash point greater than 37.8C (100F).  
Marine pollutant

**Identification:** : 1,1-Dichloroethane : UN2362 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**

California prop. 65 (no significant risk level): 1,1-Dichloroethane  
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: 1,1-Dichloroethane  
Rhode Island RTK hazardous substances: 1,1-Dichloroethane  
Pennsylvania RTK: 1,1-Dichloroethane  
Florida: 1,1-Dichloroethane  
Minnesota: 1,1-Dichloroethane  
Massachusetts RTK: 1,1-Dichloroethane  
New Jersey: 1,1-Dichloroethane  
New Jersey spill list: 1,1-Dichloroethane  
TSCA 8(b) inventory: 1,1-Dichloroethane  
TSCA 8(a) PAIR: 1,1-Dichloroethane  
TSCA 8(d) H and S data reporting: 1,1-Dichloroethane: June 1999  
TSCA 12(b) one time export: 1,1-Dichloroethane  
SARA 313 toxic chemical notification and release reporting: 1,1-Dichloroethane: 1%  
CERCLA: Hazardous substances.: 1,1-Dichloroethane: 1000 lbs. (453.6 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).  
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).  
CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**

R11- Highly flammable.  
R22- Harmful if swallowed.  
R37/38- Irritating to respiratory system and skin.  
R41- Risk of serious damage to eyes.  
R52- Harmful to aquatic organisms.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves.

Lab coat.

Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:07 PM

**Last Updated:** 10/09/2005 05:07 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

# Material Safety Data Sheet

cis-1,2-Dichloroethylene, 97%

ACC# 97773

## Section 1 - Chemical Product and Company Identification

**MSDS Name:** cis-1,2-Dichloroethylene, 97%

**Catalog Numbers:** AC113380000, AC113380025, AC113380100

**Synonyms:** cis-Acetylene dichloride.

**Company Identification:**

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

**For information in North America, call:** 800-ACROS-01

**For emergencies in the US, call CHEMTREC:** 800-424-9300

## Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
156-59-2	cis-1,2-Dichloroethylene	97	205-859-7

## Section 3 - Hazards Identification

### EMERGENCY OVERVIEW

Appearance: Clear liquid. Flash Point: 6 deg C.

**Warning! Flammable liquid and vapor.** Harmful if inhaled. Unstabilized substance may polymerize. Causes eye and skin irritation. May be harmful if swallowed. May cause respiratory tract irritation.

**Target Organs:** Central nervous system, respiratory system, eyes, skin.

### Potential Health Effects

**Eye:** Causes moderate eye irritation.

**Skin:** Causes moderate skin irritation. May cause dermatitis.

**Ingestion:** May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. May cause central nervous system depression.

**Inhalation:** May cause respiratory tract irritation. May cause narcotic effects in high concentration. Eye irritation, vertigo, and nausea were reported in humans exposed at 2200 ppm.

**Chronic:** Not available. Some German investigators reported fatty degeneration of the liver upon repeated narcotic doses in rats and

## Section 4 - First Aid Measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

**Skin:** In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes.

Get medical aid if irritation develops and persists. Wash clothing before reuse.

**Ingestion:** If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Fire or excessive heat may result in violent rupture of the container due to bulk polymerization. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Hazardous polymerization may occur under fire conditions.

**Extinguishing Media:** Use water fog, dry chemical, carbon dioxide, or regular foam.

**Flash Point:** 6 deg C ( 42.80 deg F)

**Autoignition Temperature:** 440 deg C ( 824.00 deg F)

**Explosion Limits, Lower:** 9.70 vol %

**Upper:** 12.80 vol %

**NFPA Rating:** (estimated) Health: 2; Flammability: 3; Instability: 2

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Pure vapor will be uninhibited and may polymerize in vents or other confined spaces.

**Storage:** Keep away from sources of ignition. Store in a tightly closed container. Flammables-area. Store protected from light and air.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**Exposure Limits**

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
cis-1,2-Dichloroethylene	200 ppm TWA	none listed	none listed

**OSHA Vacated PELs:** cis-1,2-Dichloroethylene: No OSHA Vacated PELs are listed for this chemical.

**Personal Protective Equipment**

**Eyes:** Wear chemical splash goggles.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** Clear

**Odor:** Pleasant odor

**pH:** Not available.

**Vapor Pressure:** 201 mm Hg @ 25 deg C

**Vapor Density:** 3.34 (air=1)

**Evaporation Rate:** Not available.

**Viscosity:** Not available.

**Boiling Point:** 60 deg C @ 760 mm Hg

**Freezing/Melting Point:** -80 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Insoluble.

**Specific Gravity/Density:** 1.2800

**Molecular Formula:** C<sub>2</sub>H<sub>2</sub>Cl<sub>2</sub>

**Molecular Weight:** 96.94

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures. This material is a monomer and may polymerize under certain conditions if the stabilizer is lost.

**Conditions to Avoid:** Light, ignition sources, exposure to air, excess heat.

**Incompatibilities with Other Materials:** Strong oxidizing agents, strong bases, copper.

**Hazardous Decomposition Products:** Hydrogen chloride, phosgene, carbon monoxide, carbon dioxide.

**Hazardous Polymerization:** May occur.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 156-59-2: KV9420000

**LD50/LC50:**

CAS# 156-59-2:

Inhalation, rat: LC50 = 13700 ppm;

**Carcinogenicity:**

CAS# 156-59-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No data available.

**Teratogenicity:** No data available.

**Reproductive Effects:** No data available.

**Mutagenicity:** No data available.

**Neurotoxicity:** No data available.

**Other Studies:**

## Section 12 - Ecological Information

No information available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	DOT regulated - small quantity provisions apply (see 49CFR173.4)	1,2-DICHLOROETHYLENE
<b>Hazard Class:</b>		3
<b>UN Number:</b>		UN1150
<b>Packing Group:</b>		II

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 156-59-2 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

**CERCLA Hazardous Substances and corresponding RQs**

None of the chemicals in this material have an RQ.

**SARA Section 302 Extremely Hazardous Substances**

None of the chemicals in this product have a TPQ.

**Section 313** No chemicals are reportable under Section 313.

**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

**Clean Water Act:**

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 156-59-2 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

**California Prop 65**

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations****European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN F

**Risk Phrases:**

R 11 Highly flammable.

R 20 Harmful by inhalation.

R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Safety Phrases:**

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 7 Keep container tightly closed.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

**WGK (Water Danger/Protection)**

CAS# 156-59-2: No information available.

**Canada - DSL/NDSL**

CAS# 156-59-2 is listed on Canada's NDSL List.

**Canada - WHMIS**

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**

Section 16 - Additional Information
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**MSDS Creation Date:** 2/09/1998

**Revision #5 Date:** 3/16/2007

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*

MSDS Number: **T4940** \* \* \* \* \* Effective Date: 12/06/07 \* \* \* \* \* Supersedes: 08/01/05

<b>MSDS</b> Material Safety Data Sheet		24 Hour Emergency Telephone: 908-859-2151 CHEMTREC: 1-800-424-9300
From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865		National Response in Canada CANUTEC: 613-996-6666
Mallinckrodt CHEMICALS		Outside U.S. and Canada Chemtrec: 703-527-3887
J.T. Baker		NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.
All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.		

## TRICHLOROETHYLENE

### 1. Product Identification

**Synonyms:** Trichloroethene; TCE; acetylene trichloride; Ethinyl trichloride

**CAS No.:** 79-01-6

**Molecular Weight:** 131.39

**Chemical Formula:** C<sub>2</sub>HCl<sub>3</sub>

**Product Codes:**

J.T. Baker: 5376, 9454, 9458, 9464, 9473

Mallinckrodt: 8600, 8633

### 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroethylene	79-01-6	100%	Yes

### 3. Hazards Identification

#### Emergency Overview

**WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.**

**SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison)

Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

#### Potential Health Effects

##### Inhalation:

Vapors can irritate the respiratory tract. Causes depression of the central nervous system with symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness, heart effects, liver effects, kidney effects, and death.

##### Ingestion:

Cases irritation to gastrointestinal tract. May also cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, pulmonary edema, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 ml/kg.

##### Skin Contact:

Cause irritation, redness and pain. Can cause blistering. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.

##### Eye Contact:

Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.

##### Chronic Exposure:

Chronic exposures may cause liver, kidney, central nervous system, and peripheral nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output. This material is linked to mutagenic effects in humans. This material is also a suspect carcinogen.

##### Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, cardiovascular disorders, impaired liver or kidney or respiratory function, or central or peripheral nervous system disorders may be more susceptible to the effects of the substance.

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## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.

**Skin Contact:**

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

**Note to Physician:**

Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

---

## 5. Fire Fighting Measures

**Fire:**

Autoignition temperature: 420C (788F)

Flammable limits in air % by volume:

lcl: 8; ucl: 12.5

**Explosion:**

A strong ignition source, e. g., a welding torch, can produce ignition. Sealed containers may rupture when heated.

**Fire Extinguishing Media:**

Use water spray to keep fire exposed containers cool. If substance does ignite, use CO<sub>2</sub>, dry chemical or foam.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

---

## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

Trichloroethylene:

-OSHA Permissible Exposure Limit (PEL):

100 ppm (TWA), 200 ppm (Ceiling),

300 ppm/5min/2hr (Max)

-ACGIH Threshold Limit Value (TLV):

10 ppm (TWA) 25 ppm (STEL); A2 Suspected Human Carcinogen.

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airtight hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

**Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment.

**Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**

Clear, colorless liquid.

**Odor:**

Chloroform-like odor.

**Solubility:**

Practically insoluble in water. Readily miscible in organic solvents.

**Specific Gravity:**

1.47 @ 20C/4C

**pH:**

No information found.

**% Volatiles by volume @ 21C (70F):**

100

**Boiling Point:**

87C (189F)

**Melting Point:**

-73C (-99F)

**Vapor Density (Air=1):**

4.5

**Vapor Pressure (mm Hg):**

57.8 @ 20C (68F)

**Evaporation Rate (BuAc=1):**

No information found.

---

## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage. Will slowly decompose to hydrochloric acid when exposed to light and moisture.

**Hazardous Decomposition Products:**

May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong caustics and alkalis, strong oxidizers, chemically active metals, such as barium, lithium, sodium, magnesium, titanium and beryllium, liquid oxygen.

**Conditions to Avoid:**

Heat, flame, ignition sources, light, moisture, incompatibles

---

## 11. Toxicological Information

**Toxicological Data:**

Trichloroethylene: Oral rat LD50: 5650 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.

**Reproductive Toxicity:**

This material has been linked to mutagenic effects in humans.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Trichloroethylene (79-01-6)	No	Yes	2A

---

## 12. Ecological Information

**Environmental Fate:**

When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

**Environmental Toxicity:**

The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be slightly toxic to aquatic life.

---

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

## 14. Transport Information

Domestic (Land, D.O.T.)

-----  
**Proper Shipping Name:** TRICHLOROETHYLENE  
**Hazard Class:** 6.1  
**UN/NA:** UN1710  
**Packing Group:** III  
**Information reported for product/size:** 4L

**International (Water, I.M.O.)**

-----  
**Proper Shipping Name:** TRICHLOROETHYLENE  
**Hazard Class:** 6.1  
**UN/NA:** UN1710  
**Packing Group:** III  
**Information reported for product/size:** 4L

## 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Trichloroethylene (79-01-6)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	DSL	NDSL	Phil.
Trichloroethylene (79-01-6)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302- RQ	TPQ	-SARA 313- List	Chemical Catg.
Trichloroethylene (79-01-6)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----				
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)	
Trichloroethylene (79-01-6)	100	U228	No	

Chemical Weapons Convention: No      TSCA 12(b): No      CDTA: No  
 SARA 311/312: Acute: Yes      Chronic: Yes      Fire: No      Pressure: No  
 Reactivity: No      (Pure / Liquid)

**WARNING:**

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

**Australian Hazchem Code:** None allocated.

**Poison Schedule:** S6

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NEPA Ratings:** Health: 2 Flammability: 1 Reactivity: 0

**Label Hazard Warning:**

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

**Label Precautions:**

Do not get in eyes, on skin, or on clothing.  
 Do not breathe vapor.  
 Keep container closed.  
 Use only with adequate ventilation.  
 Wash thoroughly after handling.  
 Keep away from heat and flame.

**Label First Aid:**

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician. Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 8.

**Disclaimer:**

\*\*\*\*\*

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This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.

Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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\*\*\*\*\*

**Prepared by:** Environmental Health & Safety  
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **T0767** \* \* \* \* \* Effective Date: 05/19/08 \* \* \* \* \* Supersedes: 08/16/05

<b>MSDS</b> Material Safety Data Sheet		24 Hour Emergency Telephone: 908-859-2151 CHEMTREC: 1-800-424-9300
From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865		National Response in Canada CANUTEC: 613-996-6666
Mallinckrodt CHEMICALS		Outside U.S. and Canada Chemtec: 703-527-3887
J.T. Baker		NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.
All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.		

## TETRACHLOROETHYLENE

### 1. Product Identification

**Synonyms:** ethylene tetrachloride; tetrachloroethene; perchloroethylene; carbon bichloride; carbon dichloride

**CAS No.:** 127-18-4

**Molecular Weight:** 165.83

**Chemical Formula:** Cl<sub>2</sub>C:CCl<sub>2</sub>

**Product Codes:**

J.T. Baker: 9218, 9360, 9453, 9465, 9469

Mallinckrodt: 1933, 8058

### 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Tetrachloroethylene	127-18-4	99 - 100%	Yes

### 3. Hazards Identification

#### Emergency Overview

**WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.**

**SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

#### Potential Health Effects

##### Inhalation:

Irritating to the upper respiratory tract. Giddiness, headache, intoxication, nausea and vomiting may follow the inhalation of large amounts while massive amounts can cause breathing arrest, liver and kidney damage, and death. Concentrations of 600 ppm and more can affect the central nervous system after a few minutes.

##### Ingestion:

Not highly toxic by this route because of low water solubility. Used as an oral dosage for hookworm (1 to 4 ml). Causes abdominal pain, nausea, diarrhea, headache, and dizziness.

##### Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.

##### Eye Contact:

Causes irritation, redness, and pain.

##### Chronic Exposure:

May cause liver, kidney or central nervous system damage after repeated or prolonged exposures. Suspected cancer risk from animal studies.

##### Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance. The use of alcoholic beverages enhances the toxic effects.

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## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**

Aspiration hazard. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:**

Wash skin with soap or mild detergent and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

**Note to Physician:**

Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

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## 5. Fire Fighting Measures

**Fire:**

Not considered to be a fire hazard but becomes hazardous in a fire situation because of vapor generation and possible degradation to phosgene (highly toxic) and hydrogen chloride (corrosive). Vapors are heavier than air and collect in low-lying areas.

**Explosion:**

Not considered to be an explosion hazard. Containers may explode when involved in a fire.

**Fire Extinguishing Media:**

Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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## 7. Handling and Storage

Store in a cool, dry, ventilated area away from sources of heat or ignition. Isolate from flammable materials. Protect from direct sunlight. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL):

100 ppm (TWA), 200 ppm (ceiling),

300 ppm/5min/3-hour (max)

-ACGIH Threshold Limit Value (TLV):

25 ppm (TWA), 100 ppm (STEL); listed as A3, animal carcinogen

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus.

**Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:**

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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## 9. Physical and Chemical Properties

**Appearance:**

Clear, colorless liquid.

**Odor:**

Ethereal odor.

**Solubility:**

0.015 g in 100 g of water.

**Specific Gravity:**

1.62 @ 20C/4C

**pH:**

No information found.

**% Volatiles by volume @ 21C (70F):**

100

**Boiling Point:**

121C (250F)

**Melting Point:**

-19C (-2F)

**Vapor Density (Air=1):**

5.7

**Vapor Pressure (mm Hg):**

18 @ 25C (77F)

**Evaporation Rate (BuAc=1):**

0.33 (trichloroethylene = 1)

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## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage. Slowly decomposed by light. Deteriorates rapidly in warm, moist climates.

**Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition. Hydrogen chloride gas and phosgene gas may be formed upon heating.

Decomposes with moisture to yield trichloroacetic acid and hydrochloric acid.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong acids, strong oxidizers, strong alkalis, especially NaOH, KOH; finely divided metals, especially zinc, barium, lithium. Slowly corrodes aluminum, iron and zinc.

**Conditions to Avoid:**

Moisture, light, heat and incompatibles.

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## 11. Toxicological Information

Oral rat LD50: 2629 mg/kg; inhalation rat LC50: 4100 ppm/6H; investigated as a tumorigen, mutagen, reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Tetrachloroethylene (127-18-4)	No	Yes	2A

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## 12. Ecological Information

**Environmental Fate:**

When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into water, this material is not expected to biodegrade. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals.

**Environmental Toxicity:**

The LC50/96-hour values for fish are between 1 and 10 mg/l. The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be toxic to aquatic life.

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## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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## 14. Transport Information

**Domestic (Land, D.O.T.)**

-----  
**Proper Shipping Name:** TETRACHLOROETHYLENE

**Hazard Class:** 6.1

**UN/NA:** UN1897

**Packing Group:** III

Information reported for product/size: 4L

**International (Water, I.M.O.)**

-----  
**Proper Shipping Name:** TETRACHLOROETHYLENE

**Hazard Class:** 6.1

**UN/NA:** UN1897

**Packing Group:** III

**Information reported for product/size:** 4L

**International (Air, I.C.A.O.)**

-----  
**Proper Shipping Name:** TETRACHLOROETHYLENE

**Hazard Class:** 6.1

**UN/NA:** UN1897

**Packing Group:** III

**Information reported for product/size:** 4L

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## 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----  
Ingredient TSCA EC Japan Australia  
-----  
Tetrachloroethylene (127-18-4) Yes Yes Yes Yes

-----\Chemical Inventory Status - Part 2\-----  
Ingredient Korea --Canada-- DSL NDSL Phil.  
-----  
Tetrachloroethylene (127-18-4) Yes Yes No Yes

-----\Federal, State & International Regulations - Part 1\-----  
Ingredient -SARA 302- -SARA 313-  
RQ TPQ List Chemical Catg.  
-----  
Tetrachloroethylene (127-18-4) No No Yes No

-----\Federal, State & International Regulations - Part 2\-----  
Ingredient CERCLA -RCRA- -TSCA-  
261.33 8(d)  
-----  
Tetrachloroethylene (127-18-4) 100 U210 No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No  
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No  
Reactivity: No (Pure / Liquid)

**WARNING:**

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

**Australian Hazchem Code:** 2[Z]

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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## 16. Other Information

**NFPA Ratings:** Health: 2 Flammability: 0 Reactivity: 0

**Label Hazard Warning:**

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER.  
Risk of cancer depends on level and duration of exposure.

**Label Precautions:**

Do not get in eyes, on skin, or on clothing.

Do not breathe vapor or mist.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

**Label First Aid:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING.

Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

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